# THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—18TH YEAR. SYDNEY, SATURDAY, NOVEMBER 14, 1931. No. 20.

## Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

**ORIGINAL ARTICLES—** PAGE.

The Anne MacKenzie Oration: "The Australian Child and the Progress of Child Welfare," by HARVEY SUTTON .. .. .. .. .. .. .. .. 603

"A Scheme for Preparation of Solutions for Local Anæsthesia by Tablets," by C. E. CORLETTE, M.D., Ch.M., F.R.A.C.S. .. .. .. .. .. 616

"The Significance of Gastric Hypersecretion as Revealed by X Ray Examination of the Stomach," by FRANK L. APPERLY, M.A., D.Sc., M.D. .. .. .. .. .. .. .. .. .. .. .. 618

"A Simple Treatment for Rectal Prolapse," by DOUGLAS GALBRAITH, M.D. .. .. .. .. .. 620

**REPORTS OF CASES—**

"The Action of the Herpes Zoster Virus in its More Unusual Manifestations," by FRANCIS E. BROWNE, M.B., B.S. .. .. .. .. .. .. 621

**REVIEWS—**

England and Her Problems .. .. .. .. .. 622

Alcoholism .. .. .. .. .. .. .. .. .. .. 622

**LEADING ARTICLES—**

Cancer and the Public .. .. .. .. .. .. .. 623

**CURRENT COMMENT—**

Married Life .. .. .. .. .. .. .. .. .. .. 624

"Sanocrysin" .. .. .. .. .. .. .. .. .. .. 625

**ABSTRACTS FROM CURRENT MEDICAL LITERATURE—** PAGE.

Ophthalmology .. .. .. .. .. .. .. .. .. 626

Oto-Rhino-Laryngology .. .. .. .. .. .. 627

**SPECIAL ARTICLES ON AIDS TO DIAGNOSIS—**

The Cutaneous Tuberculin Tests of Pirquet and Mantoux .. .. .. .. .. .. .. .. .. .. 628

**BRITISH MEDICAL ASSOCIATION NEWS—**

Scientific .. .. .. .. .. .. .. .. .. .. .. 629

Nominations and Elections .. .. .. .. .. 631

**HOSPITALS—**

The Royal Alexandra Hospital for Children .. .. 631

**PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS—**

Victoria .. .. .. .. .. .. .. .. .. .. .. 633

**BOOKS RECEIVED** .. .. .. .. .. .. .. .. .. 634

**DIARY FOR THE MONTH** .. .. .. .. .. .. .. .. 634

**MEDICAL APPOINTMENTS VACANT, ETC.** .. .. .. 634

**MEDICAL APPOINTMENTS: IMPORTANT NOTICE** 634

**EDITORIAL NOTICES** .. .. .. .. .. .. .. .. 634

## The Anne MacKenzie Oration.[1]

### THE AUSTRALIAN CHILD AND THE PROGRESS OF CHILD WELFARE.

By HARVEY SUTTON,

*Professor of Preventive Medicine, University of Sydney.*

THE oration which it is my honour and privilege to deliver this evening, has been founded as the tribute of an esteemed son of Australia to the memory of his mother, Anne MacKenzie. The intenton of this public spirited foundation is: "to stress the importance of preventing or diminishing distress and disabilities in the human body by the study of preventive measures and secondly to familiarize the public with recent discoveries in medical science, the history of human development and the methods which should be adopted for the improvement of the efficiency of the body."

Preventive medicine is a modern term designed to express the application of medical science to the prevention of disease.

It is by the study of the underlying causes of disability, disease and death that we hope to provide and maintain in every individual a full measure of health and vigour, and to assure to everyone the complete natural span of life so that "his days may be long in the land," and not merely long, but efficient and happy to the end.

To the manual and professional worker alike personal good health is an essential asset and ill-health an expensive catastrophe. Whether we consider the urge of the instinct of self-preservation, the sense of social duty as a citizen or the responsibility of work or parenthood, personal health is of paramount importance.

Preventive medicine is the province where medicine joins hands with common sense.

[1] Delivered at Canberra, March 26, 1931.

The subject selected is the Australian child and the progress of child welfare.

The story of health progress and child welfare in the twentieth century will be best appreciated by beginning with some account of its historical background. In the beginning of history references to children are scanty in the extreme. In older civilizations infant welfare was largely controlled by economic and religious ideas.

Where food was plentiful, population not excessive and the child a useful economic unit, as in pastoral or agricultural life, the natural tendency was to obey the injunction "be fruitful and multiply," and children grew up welcome and well-cared-for beings. Amongst the crowded populations of cities, or in the uncertain life of hunters and nomads unendowed with wealth of flocks and herds, children became neglected or infanticide was practised. Among the Canaanites babies were thrown to the fires of Moloch, or among the Spartans exposed to the rigors of the weather. Even today infanticide is well known in China and was practised by our own aborigines in recent times. Urban life has always proved a menace to the very existence of children, the population of cities in the past being maintained by continual reinforcements from the country. Against infanticide and similar abominations Israelite, Christian and Mohammedan have in turn set their face. The patriarchal Hebrew has always accepted children as a heritage from the Lord and large families as a divinely sanctioned policy—a policy relied on down the centuries by the Hebrew race as a defence against oppression—a policy which Pharaoh well appreciated when he ordered the killing of the first born.

Christianity placed the child on a pedestal, the first and only religion to attach such importance to young people. In unequivocal terms the Messiah drew attention to their supreme value and potentialities, "for of such is the Kingdom of Heaven," and delivered drastic judgement on whoever should offend one of these little ones: "It were better that a millstone be hanged round his neck and he be cast into the sea." Yet it has taken Christian nations nearly nineteen centuries to apply in practical form the principles expounded by their founder.

The power of life and death given to the father by Roman law fell like a blight on child life. It must be acknowledged, however, that though babies were sometimes killed, children, allowed to live, as a rule received reasonable care. Constantine, A.D. 318, made infanticide a capital offence.

The first medical writer on child hygiene and the first advocate of breast feeding was Soranus of Ephesus in the first century *anno Domini*.

The dark ages which succeeded the long Roman peace, proved a chaotic period through which mankind groped its way, paying a heavy toll in child life. Exposed as Europe was for over a thousand years to the frequent ravages of famine, war and pestilence, it is no wonder that in mediaeval times the death rate in young children and babies was extremely high and was regarded as either inevitable or the result of the evil eye or, as in the fairy tales, the influence of some wicked fairy or witch.

In Cairo today it is bad manners to praise a baby, and the mother would be greatly upset, as the evil jinns may thus have their attention attracted and carry off the baby as their prize. It is not surprising to find in Cairo from one-third to one-half of all babies born dying before reaching their first birthday.

Throughout the centuries in times of poverty and distress infants were frequently abandoned and died from exposure, and it required the humanitarian efforts of a Francis of Assisi and later (1639) a Vincent de Paul to champion the cause of children and make real provision for these unfortunate unwanted babies.

Education was limited to a small proportion of the population and chiefly fostered by the church. Ability to read and write was the mark of the cleric. The first Norman King of England who was well educated was Henry I, "Beauclerc," who did so much for the founding of the University of Oxford.

Wycliffe's criticism of the illiteracy even of priests stimulated William of Wykeham to establish Winchester School, 1394, the first important school in our modern sense in England. The diffusion of knowledge made possible by the introduction of printing, the desire for learning, and the infusion of the scientific spirit of the Greeks which came with the Renaissance gave rise to the grammar schools which came into being early in the sixteenth century (Henry VIII). Colet, who refounded Saint Paul's School, 1511, wrote on "Precepts of Living," 1509, and also an "Introduction to the Eight Parts of Speech," 1515. Elyot's "The Governour" lays down current ideas on education (1516).

Lydgate's "Babees Book" (fourteenth century), Phaer, "The Boke of Children," 1544, are solitary efforts on child welfare. The first law concerning young persons appears to be the *Apprentices Statute* of 1406.

In criticizing the Elizabethan period, it may be said that though human nature in its essence may not have altered, mankind has developed more and more control over its environment. The privileges of the few have nowadays become the birthright of the many. Standards of living, of cleanliness, of comfort, of morality, have in general advanced. Less clearly may we consider happiness to be more general, certainly the miseries of famine, war and pestilence, of poverty, cruelty and starvation are at least less frequent today. The Elizabethan's life may have been merry, but it was certainly often a short one. Laws were savagely drastic, hellfire the chief spur to devotion. The blind, the halt and the lame combined to form a litany of suffering.

Yet the passion for freedom and liberty, a sense of fairness and humanity, interest in sport and humour and song, skill in arts and crafts, feelings

of wonder and of gaiety, of compassion for the weak, and of parental love were real things in the life of Shakespeare's day. The Bible and Shakespeare established them for all time in our race. The Elizabethans were in fact, to quote Kipling, "not plaster saints but human flesh and blood most remarkably like you."

The traditional view of Solomon on the evil of sparing the rod ruled the mind of the pedagogue and the belief in the birch tree as the tree of knowledge held sway even up to recent times, 1850 or later. It is not surprising that the Elizabethan boy crep "unwillingly to school"! Even now there are parents and teachers who believe like Dr. Johnson when he heard of a flogging being discontinued: "What the boy gains at one end he loses at the other." The Royal Prince Edward VI had his whipping boy. John Wesley in 1763 expected his children to join in family prayers, to bear the rod without loud weeping and to have as much weak beer as they liked.

Ascham in Elizabeth's reign and John Locke in 1690 protested against corporal punishment, but these were voices "crying in the wilderness," and in "Sandford and Merton" we realize that many masters were keen floggers.

Modern knowledge of diseases of children may be considered as commencing with the investigation on rickets reported by Glisson in 1650. This disease, now recognized as a deficiency phenomenon, was clearly defined and some suggestions made for its treatment. This pioneer effort by English physicians caused rickets to be described on the Continent (an intended compliment) as the "English disease."

In 1662 Captain John Graunt states in his "Bills of Mortality" that 36% of all quick conceptions died before six years old. The average length of life was less than twenty years. Half the population was dead by twelve years. He gives the population of England as nearly six and a half millions (almost exactly equal to that of Australia today).

The stimulus of the regulations against leprosy in Leviticus and the accumulated experience of bubonic plague of the fourteenth to seventeenth centuries and of syphilis in the fifteenth and sixteenth centuries had impressed on the minds of the people the idea of a *contagium vivum*, something which could spread by more or less intimate contact from the sick person and transmit disease to the healthy.

Preventive methods were at times curious. In the time of the plague, 1662, at Eton College the boys had to puff at pipes of tobacco in class, apparently to disinfect the air, and were chastized if they did not conscientiously carry this out. The dietary, one may note, was chiefly beef and beer; at Winchester two days a week a milk and fruit pudding was allowed. Children have always been much the same, as Isaac Watts, 1720, realized when he wrote the familiar hymn, "Let Dogs Delight to Bark and Bite," and the youthful Washington in 1734 wrote out 110 rules of civility and decent behaviour.

Superstition, the belief in witchcraft and the power of magic, though retreating before the advance of experimental science (Royal Society, 1662) and scientific thought (Bacon, 1543), still held sway. Thousands of witches were burned under the Commonwealth. Dr. Johnson as a boy was brought to Queen Anne to receive the royal touch for the King's evil or scrofula. Scrofula is rarely seen today and is due to improper devitaminized diet, lack of sunshine and possibly tuberculous infection. Johnson carried the scars for life in spite of the attention of the Queen. This royal prerogative died out with the Stuarts about 1770, George I having referred applicants to the "Pretender."

The real beginning of modern preventive medicine dates back to the middle of the eighteenth century. Within the next hundred years, 1740-1840, the population of England grew from seven millions to forty millions. Many explanations are made for this remarkable growth, which changed the whole history of the British race, and indeed of the world.

The industrial revolution and the genius of invention responsible for the development of coal and iron and steam provided, it is true, employment and subsistence for these millions, but do not explain their origin. In the eighteenth century plague ceased (1720), housing had improved, as artillery made fenced cities useless, dietary had improved, thanks to the success of the East India Company and Elizabethan colonization. Our wars with the Dutch concerned spices, coffee *et cetera*, and oranges came in with Charles II. England was still a rural community.

All this meant improved health, and although smallpox menaced especially young children (80% of deaths from smallpox were in children under five), the natural increase must have been considerable to permit of such a rapid growth. Newsholme estimates that the proportion of children dead before five years of age dropped from 75% in 1725 to 40% before 1800 and by 1821 to 33%.

If the Elizabethan period represents the birth of English literature, then the Georgian represents the birth of social and philanthropic efforts. The enthusiasm for humanity associated with such names as Jeremy Bentham, Edmund Burke, Elizabeth Fry, John Howard, Hannah More, Adam Smith, John Wesley, Samuel Wilberforce, was to transform society.

Among the less distinguished but excellent beginnings in medical care and attention of children may be noted the dispensary for the infant poor (1769, Armstrong).

Armstrong, who had been a pioneer in the study of children's diseases ("Essay on Diseases Most Fatal to Infants," 1767), attempted to meet the needs of children under four who were refused admission to hospitals, probably because of the fear of epidemics of infectious diseases common at this age. He conceived the novel idea of a dispensary for out-patients and even thought of a

scheme of home visiting. It was left to Bunnell Davis to develop this idea in the early nineteenth century.

Armstrong criticized the favourite diagnosis of teething and worms (not unfamiliar to modern ears). Underwood, 1784, strongly advocated breast feeding and was the first to criticize the prevailing superstition as to the dangers of teething (a superstition still adhered to today). Only fifty years ago dentition was set down as one of the chief causes of illness at children's hospitals, and the lancet for lancing gums was in frequent use. Today the gum lancet for babies is a curiosity among pædiatrists, and the American maxim that teething produces nothing but teeth fairly represents scientific opinion. We require no scapegoats in the teeth to divert our attention from the dangers of dirt and flies and the value of breast feeding and care of food in general in preventing, not physiological upsets, but bacterial poisoning.

In 1776 came the declaration of independence, the publication of the "Wealth of Nations" (Adam Smith) and of Jeremy Bentham's phrase, "the greatest good to the greatest number," the maxim for democratic government and the active principle of public health today. In 1777 the first great work on public hygiene, including child hygiene, was produced by Frank, whose name is to be seen among the pioneers of public health recorded on the walls of the great London School of Hygiene.

The greatest single discovery in preventive medicine and fraught with enormous benefit to children was the proof of the value of vaccination by Jenner, 1798. Wherever virulent smallpox strikes, the brunt in unvaccinated populations is borne by children under five years of age. In 1785 they furnished 80% of the deaths from smallpox, in 1885 less than half this figure. In the later eighteenth century one in every nine deaths was due to smallpox. Wherever vaccination has been tried, whether in European countries, like Denmark, or in the Australian Imperial Force during the war, smallpox ceases to be of importance. In Australia today, as in pre-vaccination times in England, were a virulent smallpox epidemic to arise, as is not impossible, then the mortality in many unvaccinated infants would be a real tragedy. In England, with compulsory vaccination, 1853, and compulsory vaccination officers, 1871, deaths from smallpox fell from 58,614 in 1867-1876 to 139 in 1907-1916 (Newsholme). Our isolation from the world is a useful but not infallible protection on which we are placing too complete a reliance.

Besides vaccination the chief discovery of importance to children in the eighteenth century was the work of Lind on the prevention and treatment of scurvy. This work was tested by Lieutenant James Cook in his voyage round the world in His Majesty's Ship *Resolution* 1772-4. This was our first real knowledge of the prevention of the group of diseases due to deficiency in diet which still have their main incidence in young children.

One of the greatest blots on the eighteenth century was the tragic wastage of infant life in association with foundling hospitals and wet nurses. The London Foundling Hospital was established in 1741 and was so successful that many similar institutions were established. So terrible was the mortality that Malthus made the cynical remark: "No more effective means of arresting growth in population could be found than to multiply institutions for receiving new-born infants." Even at the present day the liability to fatal epidemics causes this type of institution to attain a sinister death rate. The best record in the world, one may note, is that of the Infants' Home at Ashfield, the arrangements for which were perfected under the guidance of Professor Mills.

Nevertheless the London Foundling Hospital represented the first great step forward in the development by the community at large of a sense of responsibility for child life, and especially a realization of the needs and importance of infants and young children.

Its establishment in 1741 with almost universal public support was the achievement of a retired shipmaster, Thomas Coram, whose feelings had been aroused by the frequent sight of unwanted infants exposed to the weather and their dead bodies thrown on dunghills.

The effort by the governors to obtain guidance and information as to the best methods of caring for these foundlings gave rise to the first sound modern work on child health, "An Essay upon Nursing and the Management of Children," by Dr. William Cadogan. The common sense principles and practice he advocated revolutionized the methods of rearing children throughout the civilized world. It abolished the swaddling of children, a practice previously universal and still found in primitive tribes. Our own children owe to Cadogan their present liberty of kicking their legs freely, and also it may be noted the daily bath and change of clothing which our ancestors thought "robbed children of their nourishing juices."

Cadogan drew attention to the high fatality in "dry nursed" (bottle fed) children. It is amusing to read of the accusation levelled against him of prohibitionist because he recommended moderation in food and drink as a prevention of gout. "He may safely indulge once a week or perhaps twice for the sake of good humour and good company, if they cannot be enjoyed without it."

The lessons of Coram and Cadogan were driven home to the public conscience by the philanthropic efforts of Jonas Hanway. Hanway, a man of strong personal convictions, for he is given the credit of being the first person to use an umbrella in the London streets, interested himself in the parish workhouses and their attitude to destitute infants who were their legal responsibility, a responsibility which they avoided or shortened by fair means or foul.

In 1761, as the result of his efforts, an act to keep children alive, as it was popularly described, was

passed for an annual register to be kept of all parish poor under four years of age within the bills of mortality.

Following this up, Hanway showed the mortality of all children received in London parish workhouses was not less than 80% ("or, if you please, upon those received under twelve months old, 99%") and that this represented, when compared to the mortality rates of the Foundling Hospital, the preventible deaths of three hundred children each year in London itself.

In 1767 his efforts were rewarded by Parliament insisting on the adoption of the Foundling Hospital practice (which Hanway advocated). All parish infants had to be sent to nurses at least three miles out of town and under direct supervision until six years of age. Hanway's devotion to this self-appointed task made a profound impression on the people of his generation, and accelerated, if it did not commence, the decline in infantile mortality.

Wet nurses were at their hey-day about the end of the eighteenth century, and were chiefly unmarried mothers who sacrificed their own children for this lucrative employment. Baby farming continued its murderous influence right through the nineteenth century until ended by the *Infant Life Protection Act* of 1872. Alcoholism was extremely rife and the ability to stand up against the effects of three bottles of port, a common test of gentility. Archdall Reid suggests that our relatively sober habits today have arisen by the operation of the law of the survival of the fittest in the deluging of our ancestors with alcohol in this century.

The nineteenth century has rightly been termed the century of the child. Before this period, like the cats of the present day, children had scarcely any legal significance. In 1802 Peel attempted by legislation to obtain some measure of control for child labour in factories. Robert Owen tells us in 1816 that children from five to six years of age and upwards worked fourteen to sixteen hours a day and six days a week. Much of the labour used in factories was drawn from collections of orphans, which were all too numerous in the country. Chimney sweepers provided an outstanding case of child oppression which continued up till 1840, a picture of which is given in Kingsley's "Water Babies." From the legislative point of view public health and child welfare can hardly be said to have been known one hundred years ago. "No act of sanitary intention then existed," it is stated, "on the statute books of England." The only attempt at public health control by the government was a vote of £2,000 for the supply of vaccine lymph, chiefly to London. Insanitation was rife and the penalty was paid in the succession of epidemics of cholera which visited England between 1826 and 1873. The fear of pestilence provided the necessary motive force to the legislator. In 1832 Chadwick obtained the registration of births, deaths and marriages, and in 1833 some measure of protection for children in factories, inspectors being appointed to see that the provisions of the Act were carried out. The Parliamentary Committee's report, 1842, "On the Health of Large Towns" is an epic of insanitation and demonstrated the high fatality in young children and the unhealthy conditions of the homes of work-people. These revelations gave rise in 1848 to the first *Public Health Act*, in which a new principle was upheld, namely, the responsibility and right of the Crown to interfere in matters of health. This new spirit shows itself also in Palmerston's reply in 1853 to an appeal for a general religious fast owing to the prevailing epidemic disease: "When man has done his utmost for his own safety then it is time to invoke the blessing of heaven."

The earlier years in the nineteenth century were extraordinarily fruitful in the development of exact science and of the application of scientific knowledge to the service of man. Railways, steam power, gas lighting ushered in the age of machinery. The first hospital for children's diseases was established in Paris in 1802, and medical literature begins to give occasional attention to the diseases peculiar to children. Tetany, often closely associated with rickets, was described in 1815, and infantile paralysis in 1835 and 1840. Cleft palates were operated on with some success. Diphtheria came into prominence in 1858 in sharp epidemics, rising and falling again in the course of a generation. Rheumatic heart was observed and ideas of disease came to assume a more modern character. For example, it was recognized in 1835 that many of our common diseases, like measles, were self-limited in character, in other words, they ran their course almost unaffected by ordinary drug treatment. It is the lack of recognition by the public of this self-limited character of many diseases that is still the main support of many quack medicines. Anæsthetics, such as chloroform, were discovered in the forties. Noteworthy efforts by social and literary leaders were made on behalf of children. Lord Shaftesbury, Charles Kingsley, Mrs. Barrett Browning and Charles Dickens are well known examples. Indeed, the social enlightenment which came into being with the nineteenth century made the efforts of the doctor and scientist truly effective. It is this cooperation of social forces and scientific discovery which is still our greatest need today.

The realization of the importance and rights of children grew rapidly through the life-time of Queen Victoria. It gave rise to one of the greatest social and health advances of all time, namely, universal education, free, compulsory and secular, which spread over Australia between 1871 and 1880.

In the second half of the century child welfare was further aided by the growing desire of women for training and recognition outside the home. One of the first and most important examples was the establishment by Florence Nightingale of the Nurses' Training School at Saint Thomas' Hospital, London, an aftermath of the lessons learned in the Crimean War. The importance of home visiting in the control of child mortality was first suggested by Davis in 1817. Colles's law on the apparent immunity of the mother of a syphilitic babe and

the danger to the wet nurse was outlined in 1837, while in 1844 Crede introduced the instillation of drops of silver nitrate into the eyes of the new-born babe—a most valuable preventive of ophthalmia and a measure which has saved thousands from partial or complete blindness. France, which had taken the lead in many ways in the eighteenth century, was the first to adopt school medical inspection, 1842, and to establish the first crèche in 1844.

The nineteenth century had to face difficult problems. Industrialization rapidly progressed, an increasing proportion of the population flocked into the cities and intensified the already unsatisfactory sanitation. In 1868 the British Medical Association drew the attention of the government to these evils, and a Royal commission, appointed as the result, led to the passing of the great English *Public Health Act* of 1875—an object lesson for future health laws all over the world. For the first time man gained the power to secure the cleanliness and control of his environment.

In the nineteenth century effective community control came into being. Local government began in 1835. Trades unions were organized and a permanent civil service was formed to carry out executive work of government. All this was the inevitable result of Jeremy Bentham's writings. Democracy came into its own, "the rule of the people by the people and for the people" became established. The administration of law and order on peace lines by the police force was introduced by Peel in 1829.

With the second half of the nineteenth century the progress in medical science became bewilderingly rapid. Public health, especially the study of infectious diseases, was placed on a scientific basis by the rise of the new science of bacteriology with the discoveries of Pasteur in the sixties and seventies and of Koch in the eighties and nineties.

Australian history of health progress during the latter half of last century may be briefly studied. Following the gold rush period, 1851-1860, when the population had rapidly trebled itself, we find every State with responsible government and arrangements for statistical records and health control by methods copied from England.

The next twenty years, 1860-1880, a period of increasing expansion and settlement, was marked by severe epidemics with a heavy fatality. Diphtheria appears to have come in full strength to these shores in 1858 and has remained since as one of the chief killers of children. Primitive ideas on sanitation, together with the high masculinity of the population, made typhoid fever a serious menace. As soon as women made homes and established domestic cleanliness and insisted on municipal water supplies and sanitation, typhoid fever, as the chief filth disease, began to diminish, to receive a further defeat when water sewerage systems were introduced. Wherever large groups of males get together into camps with careless sanitation, typhoid fever, as in Western Australia in 1894, will make an effective and disastrous reappearance on the stage and spread in the early and late summer by human filth and the flies bred by insanitation.

From 1860 onwards, however, in spite of a rising infantile mortality, the general death rate steadily fell, and still greater improvement is noticeable in the death rates of young children, again an evidence of better living conditions, better homes, better diet with rising prosperity.

The succeeding twenty years, 1880-1900, demonstrated to a remarkable degree the power of the cooperation of scientific knowledge, informed intelligence and sound social organization.

The science of bacteriology changed the idea of infection from a dark mystery to definite and understandable biological fact. The originators of disease could be caught and grown and studied at will like other minute plants. Pasteur and Koch put into the hands of scientific workers the technical methods by which could be studied in detail their character and behaviour and control.

Identification of disease became more exact and the disease process more clearly delimited. The physician no longer "groped in the dark for a black hat that wasn't there," but could now obtain light on the invading organism. As the preferential methods of spread of infection were defined, so it became possible to concentrate attention on the limited field where the risk lay, rather than to attempt a dragnet policy, so difficult to maintain, against all possible methods of spread. It is the difference between the training of a machine gun on a well defined objective and discharging a blunderbuss at vague objects in a fog. No longer do we in diphtheria waste time on smelly drains or doubtful water supply, still of such popular importance, but search for the human carrier with his infective throat. Air-borne infection through the open air, the old miasmatic theory, a belief which still affects land values near an infectious diseases hospital, has been discarded, but the short range effect in stagnant air indoors of the careless cougher and sneezer has been amply proved. Clothes and rooms are of minor importance. We have to deal with human diseases spreading from one human being to another by well defined, fairly direct routes. Neither filth nor smell causes fever until the carrier adds the specific infection and water or flies act as vectors.

But science alone is of little value till the knowledge it gives is made available to the community by liberal education and capable administration.

The eighties found every State with a fully established compulsory and usually free State system of education, and with medical schools in active operation at the universities.

Following the great example of the English *Public Health Act* of 1875 every State has developed a real measure of administrative control of sanitation and is making a reasonable attempt to combat the more fatal infectious diseases by health departments, water sewerage, infectious disease hospitals, health laboratories, isolation and quarantine regula-

tions, disinfection. Trained inspectors have now become an integral part of the governmental system.

The last twenty years of the nineteenth century thus mark the introduction of public health and are characterized by active measures of sanitation and the bacteriological control of infectious disease, made effective by public and medical education together with health legislation.

Cumpston sums up the nineteenth century in Australia as:

> A story of tidal waves (of disease) rising and falling with the fortunes of the colonies, but steadily declining in vigour and frequency with improvement in the economic condition of the people and with the steady spread of education.

As Cumpston has stated:

> It was only with the commencement of the twentieth century that Australia as a whole developed an informed and sensitive sanitary conscience.

Progress in public health in the twentieth century has been the cumulative result of social improvements, of governmental efforts, of humanitarian legislation and of the application of science to the needs of mankind. A changed attitude to disease is developing. No longer is it regarded as a scourge from God, but the inevitable result of imprudence and ignorance, the natural penalty for disobedience of natural law.

But, above all, a change of heart as well as mind is taking place, and today the concentration is on the human factor rather than on the control of the environment.

Compare the Royal Sanitary Commission's demands of 1871 for wholesome and sufficient water supply, prevention of pollution, provision of sewerage for healthy houses, food inspection, burial of the dead, removal of nuisances and smoke, and also suppression of causes of diseases and epidemics and registration of deaths and sickness with the national policy of Newman, 1926, which includes heredity, maternal and child welfare, school health, the health of the adolescent and the worker, education of the people in hygiene, the control of non-infectious disease, while still retaining the early requirements of sanitation, pure food supply and home hygiene and the prevention and treatment of infectious disease.

Or compare the "Magna Charta" of childhood set out by the "Save the Children Fund International Union," founded in 1920. In 1925 the Fifth Assembly of the League of Nations set out the rights of children as follows:

1. To be fed and cared for in health and in disease, whether born in or out of wedlock and whether its parents are alive or dead.
2. To have an opportunity to develop normally, both physically and mentally.
3. To be the first to receive help in times of distress.
4. To be taught a trade or occupation which will enable them to earn a living and to be protected against exploitation.
5. To be brought up as useful citizens and members of society.

Since the inauguration of the Commonwealth the progress in child welfare has quickened to such an extent that more organized efforts on behalf of children have come into successful action in the last thirty years, 1901-1930, than in the previous thirty centuries. The whole line has advanced. Social organization and welfare, and especially health activities, have developed in many directions, and none has progressed so far or done so much for humanity at large as the work amongst children—medical, health, educational and social.

We are reaping the benefits of the cumulative efforts of our Victorian forbears who virtually discovered the child. The first scientific description of physical, mental and emotional development of young children goes to the credit of Charles Darwin, 1860. Children's hospitals came into being in England and Australia after 1850, and the *Compulsory Education Acts*, 1871-1880, the greatest social experiment of modern times, forcibly brought to notice of administrations the health needs of children in the mass.

On every side we see the fruition of the pioneering efforts in the nineteenth century. The scientific knowledge of preventive medicine is becoming applied by wise administrators to millions of children. The chief reduction of infantile mortality and the appearance of the infant health centre, the extension through the States of the Commonwealth of school medical services, the practice of ante-natal care (Ballantyne, 1901) in the interests of the mother and her babe, all belong to the twentieth century and did not exist when the Commonwealth of Australia was inaugurated in 1901.

New light has been thrown on old enemies by scientific medical research activities to which, everywhere as well as in Australia, large sums of money have been devoted.

The knowledge of vitamins, with its new views on dietetic values, belongs to this generation, though deficiency diseases, rickets and scurvy, were well known and also suitable methods for their prevention. Hopkins in 1912 made clear by his studies of accessory factors their true significance.

The study of nutrition and diet is now realized to be an important basis of resistance to infectious disease. Malnutrition is the half-way house to tuberculosis. Nutrition may decide mortality, as in typhus, a mild disease in the well fed, a terrible killer of famine-stricken populations.

Milk is now recognized as the mainstay of the growth period. Corry Mann's experiments on school boys demonstrated this unmistakably. Our control of milk supply has greatly improved, for example, in cleanliness, freedom from adulteration and infrequency of human or bovine disease organisms.

It is, however, a severe criticism of our methods of distribution and economic organizations generally, that the price of milk is uniformly high, and as a consequence the consumption does not exceed one-half pint per head per day, where in children a pint per day is by no means excessive, and this in a country where dairying is an enormous industry. Cows may have a milking season, but children do not benefit from the surplus.

It is difficult to exaggerate the importance of a pure food supply with adequate growth factors or vitamins safe and cheap; yet, strange as it may be, the Londoner may often pay less for our food products than we ourselves. In the Pacific these dietetic difficulties play no inconsiderable part in the depopulation prevailing in these islands.

To the physiologist we also owe much of the modern emphasis on sunlight and fresh air and the new, though common sense, obvious conception of ventilation as the continuous supply of morning air, cool, free from dust and bacteria.

The value of certain rays of the sun for stimulating nutrition, prevention of rickets *et cetera* was proved up to the hilt by the Medical Women's Research Group in Vienna, 1923.

Apart from these medical aspects, credit is due to two groups, the dentists and the entomologists.

An immense improvement has occurred in the oral and dental condition of school children and the community at large.

In 1909, 97% and more school children in the city and 95% in the country had carious teeth, while, worse still, 30% had in their mouths dental abscesses. Such carious and septic conditions could not fail to menace the health of the child and of the community. In young adults enlisting for the war over 25% were rejected, the standard being two pairs of biting teeth in apposition. The possession of a complete natural set of teeth without the help of the dentist is a rarity. Thanks to the teaching of dental hygiene and the educational influence and treatment of the school dental clinics, 30% and more of school children do not now require treatment on inspection, and 70% of adolescents. The sound mouth without the help of treatment may be found in as many as 10%, while cleanliness and the use of the toothbrush are now becoming universal.

It is interesting, too, to note that the school dental clinics have greatly stimulated the interest in children's teeth and increased the numbers of children who attend private dentists.

The attention to the mouth of the school child is, however, incomplete, New Zealand alone maintaining, through her dental hygienists, an adequate dental supervision of every child.

The second great non-medical contribution to preventive medicine in the twentieth century is to the credit of the entomologist.

The campaign against the mosquito and other insects is the main solution of tropical disease. As the mosquito is our chief enemy in the tropics, so the house fly is our most dangerous enemy in warm, temperate climes. Where every year the snake kills a few, the fly, by its unfastidious wandering from filth to food, kills hundreds of babies and even many adults through gastro-enteritis and enteric fever. We have yet to realize that the campaign against fly breeding is the main control in sanitation in a warm, temperate climate. "No system of sanitation is satisfactory that permits the contact of the fly with infective material" is the golden rule of sanitation.

A list of some typical examples of pioneer efforts towards child health and welfare will illustrate the progress that has been made during the past eighty years.

*Nineteenth Century*, 1850-1900.

Children's hospital, London, 1852.
School ventilation, Pettenkofer, 1862.
Infantile mortality, Farr, 1865.
School vision, Cohn, 1866, Virchow, 1869.
Barnardo Homes, 1867.
Sterilization of Milk, Soxhlet, 1869.
School epidemics and construction, Chadwick, 1871.
*Education Act*, 1871, England.
*Infant Life Protection Act*, 1872.
*Public Health Act*, 1875.
Baby weighing, 1878, Ahlfeld.
"Handbook of School Hygiene," Baginsky, 1879.
Pædiatric section, 1880, Jacobi.
Pasteurization, 1872.
Infantile scurvy, 1883, Barlow.
Calf lymph depôt, 1883, Victoria.
Over-pressure in schools, 1884, Crichton Browne.
School hygiene, 1886, Dukes (Rugby).
Infant consultations, 1894, Budin.
"*Gouttes de Lait*," 1894, Variot.
Antitoxin diphtheria, Behring, 1890, Roux, 1894.
School oculist, 1893, Kerr (Bradford).
*Dairy and Milk Supervision Act*, 1894, New South Wales.

*Twentieth Century.*

Ante-natal hygiene, Ballantyne (Edinburgh), 1900-1912; New South Wales, 1912.
School nurse, Kerr (London), 1901; Victoria, 1908.
School dentist, Jessen (Strassburg), 1902, Haenke, 1911 (Queensland).
Health nurses, London, 1904; Sydney, 1904 (Armstrong).
Schools for mothers, London, 1907; New Zealand, 1907 (Truby King).
School medical inspection, Newman (England), 1908; Elkington (Tasmania), 1907.
School lunches, London, 1902.
Boy scouts.
Girl guides.
Eugenics laboratory, London, 1904.
Training teachers in hygiene, Sydney, 1904.
Montessori, Rome, 1906.
Bush Nursing, 1911.
Junior Red Cross.
Open air schools, 1911.
Nursery schools, 1911.
Maternity bonus, 1912.
Children's bureau, United States of America, 1912.
Fairbridge Farm Colony, Western Australia, 1915.
Child Health Organization, United States of America, 1916.
Hookworm Campaign, 1919.
Royal Commission on Health, 1924.
League of Nations, Child Charter, 1925.
Schools of public health *et cetera*, 1916, Baltimore; 1930, Sydney.

The problem of disease in children and of its prevention is more definite and less complicated than in the adult. In the clinical examination of the child we are neither helped nor misled by the story an adult could give us of the illness, but must rely on direct observation. The difficulties are greater, but the facts and comparisons more reliable.

The first and vital principle to realize in any study of children is their essential differences from adults, whether in structural characters, functional responses or disease susceptibilities. Children are

not miniature adults. Their body contains organs such as the thymus and structures like the epiphyseal or growth line of bones, which cease to function in the adult; while, on the other hand, the reproductive organs only late in childhood spring into full capacity and occasion those profound changes in the whole physical and mental life of the individual, which convert the child into the grown-up man or woman. Whether we take the physiologically long-sighted eye, the ear attuned to high-pitched sounds, or the pathological liability to convulsions or to generalized rather than localized infection of disease, we find a difference in kind and not merely of degree. We are dealing with a different being, not merely an incomplete adult. The formula for the child is distinct from the formula for the adult, and the adult is neither a simple arithmetical or geometrical expression of this formula.

An adult built like a baby of two, four head-lengths in height, the middle of the body at the waistline, with equal circumference of head, chest and abdomen, and weight in pounds about three-quarters of his height in inches, would be rightly regarded as a monstrosity.

This conclusion is fundamental in the study of disease in children and in prevention, in both of which, though obvious enough, it is constantly disregarded.

In mental behaviour, too, the differences are striking. The young child is amoral, not immoral, and misbehaviour should not be disciplined in the same way as in adults. It realizes concrete ideas, but any clear expression of abstract ideas cannot be expected before twelve years of age, as in the Binet test, definition of charity, justice, goodness.

Its reactions are instinctive rather than reasoned. Like a gyroscope that turns to the side when one attempts to push it over, so the child's response is often unexpected and even overlooked.

Many other examples could be given. The schoolboy may run forty races in an afternoon with brief intervals of fatigue, where the adult might not make four attempts and with prolonged fatigue as the result.

Again, poisons behave differently. Children, for example, can take adult doses of belladonna yet react in exaggerated fashion to morphine. Carbolic acid is a nasty application to the child's skin. Burns in young children, even of a small area, are extraordinarily fatal.

The two great characteristics of childhood are that it is the period of growth; growth in height and weight and in size and differentiation of organs. Hence the profound influence of dietetic deficiencies and the value of regular weighing as a test. In illness a baby's weight is of more value than the temperature of the adult, while the growth factors or vitamins in diet are all important in the child.

The second great characteristic is the exposure and reaction to infection. The specific response to various infections, and their special sequels decide most questions of mortality as well as morbidity in children.

It is in childhood that immunity is gained to many infections. Contrasted with the adult, mortality in childhood is a matter of acute infection and not of degenerative chronic or malignant disease.

During the first month of life a heavy mortality occurs practically uninfluenced by the otherwise successful efforts against mortality in infants. Not until the care of the unborn babe and its host, the expectant mother, is made universally effective, and ante-natal care and supervision are both demanded by and available for every mother, young or old, experienced or inexperienced, can any marked impression be expected on this heavy and so far apparently inevitable death rate of the first week and first month. So heavy is this mortality that were this rate to continue over the succeeding months of infant life, every child would be dead in less than three years. Failure in the growth impulse, both in amount and completeness, lies behind the many deaths from prematurity, congenital debility and congenital malformation, while more careful obstetrical help would improve the influence of injury at birth. Syphilis in many instances (15% to 20% or more) and possibly parental alcoholism in others count in this early mortality of babies.

Of similar causation is the not inconsiderable group of still-births, and these again are close linked up with maternal deaths. Of every hundred maternal deaths fifty-four are associated with dead-born children; and intranatal methods, it is estimated, could save 20% of still-born.

Maternal welfare with ante-natal care as its essential basis is of first importance and is thus essential to infant welfare.

Prematurity is one field of after-care where hope exists for the future. Successful simple methods for rearing almost any baby prematurely born alive have been standardized and demonstrated by the mothercraft centres and should be known to all and practised by all midwives and obstetricians to whom the control of this period and these children rightly belong. Further, the mother whose latent and unsuspected syphilitic infection may readily result in dead or diseased offspring can now, if treatment is begun sufficiently early before child-birth, be virtually assured of a living, healthy baby.

Preparation for the new-born has not yet become the accepted practice of mothers to the extent that the appreciation of the needs of the baby have now reached.

Seventy *per centum* and more of the mothers of the area personally attend infant health centres. The proportion that seek assistance, say, six months before birth, form still only a small proportion.

More children now die in the first month from prenatal causes than in the whole of the first year from causes arising after birth.

Ante-natal departments of hospitals show a reduction from 30‰ to 13‰ of still-births. The Federal

Health Commission has drawn attention to the need for investigation of every still-birth and for more exact definition of prematurity following the League of Nations standards of length and the registration of these still-births, as in Western Australia and New Zealand, as both a birth and a death.

Tuberculosis is but rarely passed on from parent to child; in some instances a predisposition may thus be inherited, a predisposition operating only when circumstances become unhealthy.

The proportion of early cases of tuberculosis is low, and both now and later the infection is familial. In other words tuberculosis is home grown under the parental roof and the massive dose from intimate contact indoors in the bedroom is the explanation of at least half the cases of lung tuberculosis in children. Grancher in Paris removes, with the permission of the tuberculous mother, her child from this frequently fatal contact to a healthy family, while Calmette attempts by injections of a special non-fatal or avirulent tubercle bacilli to increase the protective forces or immunity of the young child. This claim for *Bacille Calmette-Guérin* is still regarded by English observers as unproven.

The Australian child is the final test of the efforts, whether of parents, scientists, health authorities, educationists or legislators. What is the answer to the query that comes down the ages? Is it well with the child?

The child born in Australia comes into the world with many natural advantages. Hereditarily "sprung of earth's first blood" with "titles manifold," belonging to one of the whitest races on the globe—98% British—the Australian babe is widely and rightly acclaimed as Australia's best immigrant. As elsewhere, however, in the race the defects noticeable in any aggregate of human beings exist. Certain defects are inherited, such as feeble-mindedness, at least one in each 100, epilepsy one in each 1,000. Certain defects arise in embryonic life or occur at birth, for example, congenital syphilis, that unseen but terrible menace present in an undefined number of children, amounting probably to at least 7% in city populations. "The fathers have eaten sour grapes and the children's teeth are set on edge." Ante-natal control may yet reduce the numbers so handicapped. Their existence is the inevitable result of our deliberate blindness as a community to ever-present underground social evils which affect especially the wealthiest and the poorest strata of society.

In this tragic triad too often is seen the terrible position where the parents should ask the child's forgiveness for its existence. The health certificate before marriage recommended by the Royal Commission of 1924 deserves a serious trial in the interests of the unborn child. The apparent, though slow increase of feeble-mindedness must force us eventually to consider the possibility of their elimination by eugenic methods.

Other congenital defects are hernia in boys 1%, congenital heart one in 2,000, and crippling from injury at birth. Some defects may be of either hereditary or congenital origin, such as harelip, cleft palate, club foot. The latter group appears to be on the decrease in Australia. It may be noted that the influence of maternal impressions, though popularly accepted, can be definitely discarded.

Our baby enters an environment which, though imperfect, compares more than favourably with most other countries in the world, and, if not second to none, then is second only to New Zealand in offering chances of survival. The babe may be described in racing parlance as a "red hot favourite." Whereas the odds against the survival for one year of the Hindu baby in Calcutta is "3 to 1 against," the odds in favour of our little Australian are "20 to 1 on," and soon we hope will equal the rival baby of New Zealand at "25 to 1 on."

The parents are as a rule intelligent, and though not specially trained, and usually gaining their experience by experimentation on the first born, yet are not in any way inferior in parental devotion.

The baby can fairly assume that starvation will not be a risk. Cleanliness and clothing will be reasonably provided. Overcrowding may occasionally occur, and playing space for the older child in the city be unfairly cramped. The Australian environment, both by good luck and good management, will be free of many risks and confer many advantages. The indigenous population of aborigines were remarkably free of disease, and instead of being a reservoir of serious disease, malaria, yellow fever *et cetera*, have been of no significance in the transmission of disease, except, possibly, hookworm. Unfortunately for them, the diseases of the white have decimated our native populations. Cholera, epidemic typhus, hydrophobia, yellow fever are unknown, while smallpox and plague are infrequent but not impossible visitants. Hence the unvaccinated condition of children gambles on this unpredictable escape from epidemic visits. The open-air life fostered by the limited rigors of the climate, and the abundant sunshine will have as important a bearing on physical development as the privileges of speaking "the tongue that Shakespeare spake" and holding "the faith and morals . . . that Milton held" will have on his character and outlook.

Sun worship, as in ancient Greece, has found a real home in Australia, with profound influence on child health and development. With a good start at birth and through wise mothercraft, healthy home life unhampered by destitution, the perils of the great infections of summer (gastro-enteritis) due to dirt and fly carriage, and of winter (bronchitis and pneumonia), the sign of bad ventilation and adult droplet infection, may be eluded. The baby now emerges into the toddler period. During the next few years before school life begins this child runs the gauntlet of the common infections of childhood, and though the death rates have definitely decreased even more rapidly than in either infancy or later life, whooping cough in babes, measles and diphtheria in children of one

to four still exact a tribute in the slaughter of these innocents. Childhood is at this age (the very age when least help is available from any organization) our buffer against infection. The immunity to disease which is then acquired, is the very bulwark of civilization.

We rely on our toddlers to fight the battle for us, and virtually our existence as a community and our length of life as individuals is maintained by the sacrifice of many of these little ones. Well might children say, to paraphrase the poet: "If death be the price of immunity, Lord God we have paid in full."

This process of herd immunization is one of the most interesting problems of the day.

The improved cleanliness, civic and domestic, made possible by health legislation since 1875, the improved habits as regards diet, fresh air, sunlight and personal cleanliness, have all combined to reduce the dosage of infection and the fatality of these diseases.

This certainly occurs in tuberculosis, where massive dosage from the infective parent decides the appearance of the disease in the child, but many more are partially (at least) protected. The *Baciile Calmette-Guérin* method is based on this idea.

In diphtheria the process of immunization of communities can be watched, and while 5% of preschool and 4% of school children get diphtheria, the majority, 80% and more, of school leavers are immune to the disease. Contact apparently with small doses, incapable of causing disease, may yet be capable of creating immunity. In rural areas where diphtheria is not constantly occurring, few children cultivate immunity, and epidemics, when they occur, are more widespread and more serious than in urban communities.

Children in well-to-do houses with limited contact with other children tend to behave in this particular like the rural child. Diphtheria in the early epidemics of the sixties behaved as a new disease with serious mortality. It is now far less frequent, though its reduced fatality is in part at least the result of antitoxin treatment.

Measles is another striking example. Most people get measles (19 out of every 20) while epidemics in young children are often accompanied by a heavy fatality (12%); a circumstance which should cause us to protect carefully the child under five. Yet measles in older children and adults is a mild disease. Contrast this behaviour with the effects of its visit to a community without this constant contact. In the virgin soil of the Polynesian race measles has levied a 40% mortality and is perhaps the most feared disease in the Pacific. It can be just as dangerous to European communities not protected by this herd immunity, as in the epidemics in the Faroe Islands.

Isolation appears to be less valuable on the whole than contact with these diseases, provided that the contact is not too intimate nor too prolonged and the child of normal nutrition, free from congenital disease or malnutrition.

The period since 1900 has shown little, if any, improvement in the numbers affected, epidemics of measles, scarlet fever, chickenpox, whooping cough regularly recur, but the fatality has been greatly reduced, especially in scarlet fever, in which it is difficult to recognize the disease which our grandparents feared so much. Influenza, common colds, sore throats, the names given to a varied group of nose and throat infections, affect more children and adults every year than any other cause of sickness. The mortality in the severe epidemics is higher in adults, children usually having a mild type of this illness.

The other great health risk which our young Australian runs, is deficiency disease (rickets *et cetera*) and malnutrition. Rickets occurs in 25%, but, thanks to abundant sunlight, rarely occurs in severe types; such are confined almost entirely to aliens living in overcrowded quarters and on a limited diet. Breast feeding, as its practice increases, reduces its frequency, but the specious advertisements of patent foods mislead many parents. Rickets is at least four times more common in artificial feeding before six months of age, and in the breast fed occurs only when the mother's dietary is unsatisfactory.

Rickets is non-fatal, but is responsible for nearly all the postural deformities, bow legs, knock knees, twisted spine *et cetera*, and much of the backwardness in school. It is, however, eminently curable. Milk, sunlight and breaststroke swimming may eliminate both it and its deformities.

The surgical forms of rickets, the curious rhachitic, irregular formation of the teeth, the crackling sensation felt in the skull (craniotabes), the lamellar cataract of the eye, are not seen in Australian children or are extremely rare.

Scrofula, another deficiency phenomenon, not so rare in London, is almost unknown here, and the associated curious ulcer of the surface of the eye is similarly rare. Acute rheumatism, the greatest disease arising in the school period of life, seems less directly fatal and severe cases less common. For example, rheumatic nodules, often the sign of severity, are rare in Australia, though common in England.

In the campaign against tuberculosis no one class in the world has fared better than the Australian child. Queensland easily holds the record for the reduction in deaths in the forms of tuberculosis most common in children, namely, those affecting other organs than the lungs, the usual focus in adults. Tuberculosis of the bones and joints, brain membranes, abdominal and general, now represents only four deaths per million as compared with seventy-one fifty years ago and with seventeen in Britain today. Open air life and sunshine have affected alike the bovine and human sources of child infection.

The Australian school child appears remarkably free from pulmonary as well as other forms of tuberculosis. Only 25 cases (whether healed or active) could be found in an intensive survey of

70,000 children in New South Wales, yet tuberculization, the appearance of the immune reaction showing the presence of the bacillus in the body is a common finding in older children in our cities.

The great danger to fear is familial tuberculosis—the heavy, constant infection from a parental source. Probably no disease gives us so much hope for the future as tuberculosis. Easy to prevent, but much less easy to cure, it demonstrates the value of personal health in maintaining resistance reinforced by the herd immunity already mentioned.

In young children, once lung disease appears, recent investigation seems to show the position as almost hopeless, yet the actual death rate from tuberculosis is low and decreasing.

The conquest of tuberculosis seems to await us and the child will give us our next great advance in the future, for malnutrition is the half-way house to the disease.

We know that tuberculosis is an indoor disease, a lurker in the shadows; it fears the open air and sunshine. It is quelled by a sound dietary. Milk feeding has prevented more tuberculosis than ever it caused by casual bovine infection.

The examination of the school child must make us pause. That over one-quarter of these entrants to school show definite evidence of damage from the infections of earlier years must be regarded as a serious failure on our part.

School health work began in Tasmania, 1907, under Elkington. Now some forty doctors and forty dentists examine some 200,000 children yearly in Australia. The cost is low, two shillings per head of school population, and five shillings per examination. The total does not amount even to 1% of the education vote.

The Australian child is certainly not worse off, however, than other children in the Empire and elsewhere. We may claim great gains by health supervision during school life. In height and weight per age and sex the growth of the Australian boy and girl compares more than favourably with the boy and girl in England, the boy of the industrial group is surpassed in England only by children of the most favoured classes. Remember, too, the curious and important fact that the child born in Australia of Australian born parents is taller and heavier than the boy born in Australia of overseas parents, though both have lived in Australia all their lives. Both definitely exceed the immigrant child in stature and weight, and the immigrant is above the average of the homeland.

In spite of many discussions of Australian characteristics, that is almost the only definite fact yet recorded concerning the Australian child. We are growing them bigger and better. An urgent need has now arisen that we should study in every way the succeeding generations of Australians. The Australian children of overseas parents were in the majority in school in the nineties, the Australian of Australian parentage was in the majority in 1911, while the Australian of Australian grandparents is beginning to make a definite appearance.

On the other hand, the disfiguring tuberculous disease of the skin of the face, called lupus, is unknown in Australian children, though common in Britain. Sunlight is the explanation.

By the end of school life we may claim that at least half of the medical defects noted have been remedied, while dental treatment has greatly improved the cleanliness of the mouth.

We must admit certain defects limited to definite geographical areas. First, goître to areas adjacent to contours of 3,000 feet or so with good rainfall and rapid run-off, and secondly, hookworm, the infestation of which has been localized to the fifty-inch rain belt north of Kempsey and which has been reduced to an incidence of about 2% of school children. Here eternal vigilance is the price of freedom and until field sanitation is permanently established, hookworm will still persist in these areas.

Hydatid, a distinctly Australian disease, is still far from uncommon in the rural areas in the sheep belt. It vanishes with the establishment of the municipal abattoir and the elimination from the diet of dogs of the offal of diseased sheep.

Trachoma, like Barcoo rot, is found in areas into which the wheat belt and closer settlement have not yet penetrated. Though it is a definite infection spread by the fly or towels *et cetera*, its persistence is due apparently to a dietetic deficiency which disappears before the march of civilization. In Queensland and in New South Wales (trans-Darling area) the hinterland of the railway system provides many cases.

Dengue fever occurs at long intervals as an almost universal epidemic with a low fatality, 75% or more of all school children being affected. It is limited to Queensland and northern New South Wales, the southern limit of the last epidemic being just north of Newcastle inland to Walgett. Recent investigations show that the vector, *Stegomyia argenteus*, well known in other parts of the world as the yellow fever mosquito, now exists still further south, suggesting the probability of an extension of the dengue fever area.

Of not less importance than the school medical officer to child health is the school nurse (health visitor). The value of trained women in child welfare has been demonstrated in this century. The trained nurse created by Florence Nightingale revolutionized hospital treatment, especially the treatment of fevers, abolished bed sores and "sordes," so typically an accompaniment of the fever-stricken in the past, and made hospitals clean, happy, comfortable and health-giving places. The success of the general nurse encouraged the demand for the trained midwife, so that already the "Sairey Gamp" species is almost, if not absolutely, extinct. The introduction of the trained woman into public health administration has been slow, but the future of health control and progress lies in the development of public health nursing.

Health visitors, as the personal link between the health officer and the home, have been widely

employed in tuberculosis, in school nursing, 1900, London; 1908, Victoria; and infant health centres, 1907, Karitane, New Zealand, and St. Pancras, London. It introduces the human note into departmental procedure.

Thus the Gordian knot of red tape is cut and the effectiveness of departmental procedure is greatly enhanced by the trained intelligence and wide experience of this new type of health personnel. They bring into the homes an attitude of helpfulness and sympathy. They work by tact and persuasion, not by bullying or compulsion. They make parents friends of the health services and children interested helpers in the health game.

About 240 nurses are engaged in public health work in Australia, but the utilization of trained women as health personnel has not yet reached the standard of Toronto or even of Jugo-Slavia. This would include a special training of four years (including hospital training) and the employment of ten times the present number of nurses by health departments.

Life tables are perhaps considered the sole property of actuaries and life assurance; they are nevertheless fraught with human interest and demonstrate unequivocally the value of prevention and the definite increase in average length of life in the last half century. They are a remarkable testimony to child welfare. The chances of survival in infancy have been immensely improved, and the very causes that operate so strongly in favour of the babe greatly improve the survival rate for the next four years of life. This is the answer to the "better dead" school who have criticized efforts against infantile mortality, using the partial truth that thereby some unfit babies might be officiously kept alive whose presence will be an inevitable burden to the community. They contend that this is an infraction of the natural law of the survival of the fittest. The truth is that the great majority of babies are born fit. Nature already having pruned away doubtful progeny, and that the enemies of infant life cripple far more than they kill. Leaving the babe to the operation of blind chance is both inhumanity and criminal carelessness. Not only is the child mortality reduced, but human fitness has improved and much of the decrease in adult death rates referable to child and baby welfare.

Progress in mankind may be slow, but it is real, as is shown by the difference of the skulls of Neanderthal and civilized man. Even in size a group of Australian soldiers would wear outsizes of the armour of the knights of chivalry.

In functional activity similar progress occurs, and records in every phase of athletics and games go by the board almost every year. The records of thirty years ago are the commonplaces of today. The Australian child is bigger and, I believe, better. Specialization may mean something in this real improvement, but not all; but specialization is only one of the manifestations of that complexity and differentiation which mark the human as opposed to the animal. Man cannot claim to be the biggest or the fastest or the strongest. His sight, hearing, smell, touch and taste do not compare with those of certain animals, but his all-round capacity and possibilities for rapid progress by the inheritance, not merely of instinctive powers, but also of the accumulated experience and gains of preceding generations give him a preeminent position. Thanks to language, spoken and written, we stand on the shoulders of our forbears.

Once the true position of the child is recognized as our most valuable primary product, our chief buffer against infection, the medium by which national health is created, may we not look to the future with confidence.

The next great step in prevention of disease in children and in the community is the utilization of trained women as public health nurses, health workers and social workers to the task of social enlightenment by diffusion of modern ideas and methods, the solution of personal problems and the continuation of health and social activities.

Admitted that economic breakdown and financial burdens at present stand as lions in the path, Australia has more than once surmounted such depressions. Ignorance, indifference and incapacity still remain our chief barriers. The war established for ever in our minds three weapons by which the victories of peace may be attained—education, human power and team work. Education, not legislation, must be the spearpoint of our attack. Legislation is valuable in support, but is rarely a leader of public opinion. Neither the power of the human intelligence nor of human beings as a whole has been in any adequate fashion harnessed in the service of health. Health research will, we hope, form the frontier of the health forces as outlined by the Health Commission, the medical officer of health acting as adjutant and intelligence officer. We anticipate with confidence the success of the great and increasing army of mothers rapidly becoming familiar with modern methods of infant and child care. Why has the father been apparently overlooked?

Think of the possibilities if the work of 10,000 State schools and of the great army of 30,000 school teachers were enlisted in the cause of health. Were the million children of the States of the Commonwealth really taught something of the health needs and requirements of the home, of the family, of the community, of the nation, the new generation would march to victory under the banners of health, knowledge and health control. Once education swings itself in favour of teaching that adaptation to existence, called the healthy life, progress will be greatly quickened and the future full of promise.

Finally, cooperation of all concerned must be obtained. How often are well meaning and benecent schemes outflanked by some disinterested authority. Health is more important than defence. It is itself the best home defence. It is ten times cheaper and more important than so-called charity, into which, like a bottomless pit, we pay out as a

community nearly ten millions of money to remedy wastage much of which is definitely preventible, and especially preventible during child life.

Children cannot be pauperized by health efforts. "Charity" in its modern meaning is not applicable to children. Every child, whatever the family status, rich or poor, is a dependent and must be supported by someone—parent, foster-parent, or institution or government. The children's charter should be recognized as the essential policy of well ordered government.

Preventive medicine dreams of a time when there shall be no unnecessary suffering and no premature deaths; when the welfare of the people shall be our highest concern; when humanity and mercy shall replace greed and selfishness; and it dreams that all these things will be accomplished through the wisdom of man. Preventive medicine dreams of these things, not with the hope that we, individually, may participate in them, but with the joy that we may aid in their coming to those who shall live after us. When young men have vision the dreams of old men come true. (M. J. Rosenau.)

## A SCHEME FOR PREPARATION OF SOLUTIONS FOR LOCAL ANÆSTHESIA BY TABLETS.

By C. E. CORLETTE, M.D., Ch.M., F.R.A.C.S.,
*Consulting Surgeon to the Sydney Hospital.*

A PAPER of mine which appeared in this journal of February 7, 1931, on "Local Anæsthesia in General Surgery" seems to have stimulated a great and widely-voiced desire in medical men throughout Australia to learn to use the methods in their own practice. I have had a very large number of letters from men who have told me of their interest in the subject and of their desire to follow it up practically. There have been some difficulties in the way, and one has been a lack of sufficiently adaptable preparations of the materials. But I have had the pleasure of finding that two well-known drug firms were also interested, and there can now be little doubt that a serious attempt will be made to assist the movement by provision of tablets convenient for all purposes. I have been asked to make suggestions, and I think the best way is to put them into the form of a short paper.

It is desirable that the preparation of analgesic solutions for injection should be made as safe, simple, easy, and accurate as possible. It should be possible to prepare a solution of any suitable strength extemporaneously. This can be done readily only if all the requisite weighing has been carried out beforehand. The measuring of liquid volume is done when the solutions are made, and so some suitable liquid measures are required. I will add another necessary requirement, and that is a set of printed instructions giving directions how to make up solutions of any desired strength, avoiding the necessity for arithmetical calculations, mental or otherwise, and so avoiding mistakes in calculation. Mistakes are not permissible.

The materials can be put up either as powders in capsules, as easily friable tablets, or as compressed tablets. These last do not disintegrate and dissolve easily, but in other respects they fulfil their purpose. If hard tablets are used, a crushing implement is a desirable accessory.

Capsules are very convenient to use, but tablets will probably be most employed, and I will assume that we are to work with them.

Weights and measures may be either on the metric or on the imperial system. I am accustomed to the metric system myself, but it may be well to mention that 30 mils equal approximately one fluid ounce, one mil equals about 17 minims, one gramme equals a little over 15 grains, 0·3 gramme equals about five grains. Perhaps I might add here that the rather formidable-looking decimal 0·001 gramme simply means one milligramme.

Apparatus suitable for boiling water should, of course, be available. The question arises whether the solutions of all materials should be boiled, or whether it is sufficient to dissolve tablets in recently boiled water. This question I discussed in my former paper, but if any surgeon wishes to boil his solutions, the way should be made easy. If he wishes to boil his salt and his æthocaine, but to let the adrenalin go without boiling, the material provided should be such as makes that course possible. In this way all preferences can be satisfied.

Each variety of tablet should be packed in a container distinguished prominently from every other, and it seems to me that the best way is to use a differently coloured label for each kind. Perhaps some may like a large capital letter. There will be the manufacturers' distinguishing number in addition. But I am sure the best way to recognize at sight is by a colour sign.

No two tablets of different character should be of exactly the same diameter, and they should be distinguishable from one another in this way, even if out of their proper container.

These details may seem petty and ridiculous to some, but I speak from a good deal of operating room experience. As far as possible, no one should be allowed the chance of making a mistake in any way. No detail is too small, if it is good.

Tablets by two firms are on the market, each containing approximately 0·3 gramme of the analgesic drug (which we shall here call æthocaine), and 0·3 milligramme (0·0003 gramme) of adrenalin, corresponding in imperial measure to about five grains and $^1/_{220}$ of a grain, respectively. The printed directions, in each case, state that the tablets are to make one ounce (30 mils) of solution. This will then contain 1% æthocaine and one in 100,000 adrenalin. One firm's tablet is compounded with an addition of salt so as to make the solution isotonic when mixed with one ounce of plain water. The other firm's tablet has to be mixed with normal saline solution or Ringer's solution. The fact that the former solution is not isotonic unless mixed with a precisely limited quantity of plain water, makes it less adaptable for dilution, because if we want to work with the more dilute strength of 0·5% æthocaine and one in 200,000 adrenalin we must remember to mix an ounce of normal saline solution

or Ringer's solution with an ounce of plain water. Only by doing this can we keep it approximately isotonic. The other firm's tablet seems a little handier, because one makes a solution and dilutes it with the same medium throughout. If we use the latter tablet and ignore the printed directions, adding twice as much saline solution as they advise, we make the more dilute solution, which is the most widely useful. It is a pity both these tablets were not made up originally for preparing 0·5% æthocaine in one in 200,000 adrenalin.

Tablets containing approximately 0·3 milligramme, or $^1/_{220}$ of a grain, of adrenalin are marketed by two firms. In both cases they are catalogued for ophthalmic use, being intended for insertion beneath the conjunctiva, and without any idea that there may be a use for them in the preparation of solutions for local anæsthesia. But it happens that one of these in 60 mils, or two ounces, of water makes a solution of approximately one in 200,000. If, then, we were to add one of these to 60 mils, or two ounces, of the 0·5% and one in 200,000 analgesic solution as obtained above, we would get a solution containing 0·5% æthocaine and one in 100,000 adrenalin.

But we meet with a difficulty if we want to prepare a solution containing 2% of æthocaine and one in 100,000 adrenalin, such as we require for blocking the brachial plexus, the second division of the fifth nerve at the *foramen rotundum*, the third division at the *foramen ovale*, the lingual or inferior alveolar from within the mouth, or for use in fracture work.

This brings us up against a need that, as far as I know, is not met at present by any tablet preparation catalogued by manufacturing drug firms operating in Australia. We need tablets of plain æthocaine. In my own work I have met the need by specially filled gelatine capsules. If we are to have tablets, they should weigh 0·3 gramme (approximately five grains). Two of these and one of the adrenalin tablets dissolved in 30 mils, or one ounce, of normal saline solution or Ringer's solution will make the required 2% solution.

These tablets, however, will do more, because if they are used with the adrenalin tablets, a range of solutions can be made to suit many special preferences. Moreover, one becomes independent of the compounded tablets referred to above, though, personally, I would continue to use them.

But let us take one step more. I believe that hospital casualty rooms and men in general practice would find, or rather, will find before long, use for a special fracture tablet. For this particular purpose there will be an advantage in compounding with sodium chloride or Ringer's salts so as to produce an isotonic solution when dissolved in 30 mils of plain water, because it is intended to be used in that strength, and no other. It would be convenient, and it would be economical because there would be no waste; the whole of the solution is used, and used at once for the particular case. What we want is an isotonic 2% solution of æthocaine. If I am any prophet, prompt local analgesia is going to become a rule of treatment in recent fractures, and if such a tablet is available, this very desirable advance in treatment will be hastened along.

I should like to say a word here on the question whether adrenalin is necessary in a solution intended to be injected into the blood-pool between the fragments in a recent fracture. None of us, as yet, can speak from personal knowledge gained by experiments with and without. In my paper of February last I said I thought it would be better to use adrenalin, and I had been using it. But after further thought I am not so sure. The pool into which the solution is injected is stagnant, just as stagnant as the circulation in a finger when, to avoid adrenalin, a rubber ring tourniquet is put round the base and æthocaine is injected distal to the ligature. I think, therefore, that a fracture tablet would work efficiently, and give a lasting analgesia, without adrenalin. Therefore, until it is shown that an adrenalin addition is better, let us carry on without it. If that is to be our plan, the fracture tablet will contain æthocaine and sodium chloride or Ringer's salts only. The solution made with this can be safely boiled, and therefore boiling is recommended. If the solution is to be made for nerve blocking, and not for fracture work, then an adrenalin tablet would have to be added. Of course, adrenalin in a fracture tablet would not be in any way detrimental, but it would probably add something to its cost.

We may now consider how to make the solutions approximately isotonic in those cases in which the sodium chloride or Ringer's salt is not incorporated in the analgesic tablet. I find that one firm markets a tablet large enough to make normal sodium chloride solution for the purpose. Another firm markets a tablet to prepare Ringer's solution in the same quantity. Either kind should be satisfactory.

But note this about 2% solution of æthocaine. Dr. R. A. Fulton, of Dunedin, is one of the early pioneers of local anæsthesia in fracture work, having contributed records of a series of successful cases to *The British Medical Journal* in 1921, now ten years ago. In a recent private communication he has pointed out that if an isotonic saline solution is taken, and 2% of æthocaine is added, the result is a decidedly hypertonic solution. It is better to use a saline solution of about two-thirds the ordinary strength. This point should be taken care of. If a compounded tablet such as the one proposed for fractures is made, it should be made so as to incorporate just such an amount of sodium chloride or of Ringer's salt as will make the solution correctly isotonic.

### Summary of Proposals.

The proposals are here briefly summarized:

1. White label tablets. Suitable to make Ringer's solution or ordinary normal sodium chloride solution. Quantity of solution to be made by one tablet, say 120 mils (four fluid ounces).

2. Blue label tablets. Æthocaine 0·3 gramme (five grains):

One in 60 mils (two fluid ounces) = 0·5%
Two in 90 mils (three fluid ounces) = 0·66%
Three in 120 mils (four fluid ounces) = 0·75%
Two in 30 mils (one fluid ounce) = 2·0%

3. Green label tablets. Adrenalin 0·3 milligramme ($^1/_{200}$ grain):

One in 60 mils (two fluid ounces) = 1 in 200,000
Two in 90 mils (three fluid ounces) = 1 in 150,000
Two in 60 mils (two fluid ounces) = 1 in 100,000
Four in 90 mils (three fluid ounces) = 1 in 75,000

4. Red label tablets. Compound. Æthocaine 0·3 gramme and adrenalin 0·3 milligramme.

5. Orange label tablets. Compound. Æthocaine 0·6 gramme and sodium chloride or Ringer's salt to make isotonic when tablet is mixed with 30 mils (one fluid ounce) plain water. Indicate on label that it is designed to make solution for injecting between fragments in cases of recent fracture, but that if adrenalin is added it can be used for nerve blocking. If these tablets seem too large for convenience in manufacture or packing, they could be made to half the size.

### Directions for Making up Solutions.

The following are the directions for making up solutions.

1. To make 0·5% æthocaine in one in 200,000 adrenalin. Take 60 mils (two fluid ounces) salt solution, then dissolve in it one blue label tablet and one green label tablet, or dissolve one red label tablet in 60 mils (two fluid ounces) salt solution.

2. To make 0·5% æthocaine in one in 100,000 adrenalin. Take 60 mils (two fluid ounces) salt solution, and dissolve in it one blue label and two green label tablets, or dissolve one red label tablet and one green label tablet in 60 mils (two fluid ounces) salt solution.

3. To make 1% æthocaine in one in 100,000 adrenalin. Take 60 mils (two fluid ounces) salt solution and dissolve in it two blue label and two green label tablets, or dissolve two red label tablets in 60 mils (two fluid ounces) salt solution.

4. To make 0·66% æthocaine in one in 75,000 adrenalin. Take 90 mils (three fluid ounces) salt solution and dissolve in it two red label and two green label tablets, or dissolve two blue and four green label tablets in 90 mils (three fluid ounces) salt solution.

5. To make 0·66% æthocaine in one in 150,000 adrenalin. Take 90 mils salt solution and dissolve in it two red label tablets, or dissolve two blue and two green label tablets in 90 mils (three fluid ounces) salt solution.

6. To make 0·75% æthocaine in one in 100,000 adrenalin. Take 120 mils (four fluid ounces) salt solution and dissolve in it three blue label and four green label tablets, or dissolve three red label tablets and one green label tablet in 120 mils (four fluid ounces) salt solution.

7. To make 1% æthocaine in one in 200,000 adrenalin. Take 60 mils (two fluid ounces) salt solution and dissolve in it two blue and one green label tablet, or dissolve one red and one blue label tablet in 60 mils (two fluid ounces) salt solution.

8. To make 2% æthocaine, without adrenalin. Take 30 mils (one fluid ounce) plain water and dissolve in it one orange label tablet.

9. To make 2% æthocaine in one in 100,000 adrenalin. Take 30 mils (one fluid ounce) salt solution, using two-thirds the usual strength, and dissolve in it two blue label tablets and one green label tablet, or dissolve one orange label tablet and one green label tablet in 30 mils (one fluid ounce) plain water.

10. To make 0·75% æthocaine in one in 200,000 adrenalin. Take 120 mils (four fluid ounces) salt solution and dissolve in it three blue label and two green label tablets, or mix equal parts of number 1 and number 7.

11. To make 0·5% æthocaine in one in 400,000 adrenalin. Take 120 mils (four fluid ounces) salt solution and dissolve in it two blue label tablets and one green label tablet.

12. To make 0·5% æthocaine in one in 300,000 adrenalin. Mix equal parts of number 1 and number 11.

### How Should the Material be Packed?

I suggest that a double set of tablets of the various sizes and kinds should be put up together in a metal or wooden box, not too small, with a lid that will stay safely closed until it is proper for it to be open. The directions for making up solutions of different strengths should be printed in clearly legible type and pasted inside the lid, or at least placed in a pocket in the lid, certainly not printed on a loose and losable leaflet.

Other schemes may be devised for the preparation of solutions, possibly better ones, but this one seems to offer an easily workable system suitable to the wants of most of us.

## THE SIGNIFICANCE OF GASTRIC HYPERSECRETION AS REVEALED BY X-RAY EXAMINATION OF THE STOMACH.

By FRANK L. APPERLY, M.A., D.Sc., M.D.,
*Honorary Physician to Out-Patients, Saint Vincent's Hospital, Melbourne.*

DURING examination of the alimentary tract by means of the barium meal and X rays, one occasionally observes the appearance of a large volume of thin watery fluid which forms a layer above the barium in the stomach. The volume of this fluid may be as large as that of the barium meal ingested. Some refer to this as a gastric hypersecretion, and state that it is usually accompanied by an increased acidity of the gastric contents and a continuation of secretion after all food has left the stomach. In some patients there is, as is well known, a continuous hypersecretion with an increase in the contents drawn from the fasting stomach.

I have had the opportunity of examining five such cases of "hypersecretion" with results which may throw some light on this interesting condition. Briefly, their histories are as follows.

CASE I.—A female, aged thirty-five, was a markedly neurotic woman with nausea, flatulence, and fairly severe nagging pain shooting from the xiphisternal region to the interscapular area, with onset immedately after meals, worse after vibration and jolting, or eating cabbage, celery or roughage. She had constipation, pains in the right iliac fossa and headaches for weeks. Appendicectomy was performed when she was twenty-two without any improvement; examination revealed only a hard and tender ascending and descending colon.

CASE II.—A female, aged twenty-four, nervous and worried, complained of anorexia, nausea, flatulence and an aching epigastric pain of variable onset and duration, worse in the erect posture, relieved by change of position, by heat, and sometimes by alkali; she suffered from constipation. She suffered from an appendiceal abscess at twelve years of age.

CASE III.—A female, aged fifty-seven, of the worried type, complained of nausea and flatulence coming on about 5 a.m. every day, relieved by epigastric pressure. She also had flatulence and distension three hours after meals, and constipation; otherwise she was in good health. Unsuccessful cholecystectomy was performed six years ago. Abdominal examination revealed nothing of significance.

CASE IV.—A male, aged forty-eight, of broad, powerful build, but much financial worry, complained of nausea and attacks every four to eight weeks of great abdominal distension, followed by intense pain over the whole abdomen and in the interscapular region, lasting up to several days, often with diarrhœa. Between attacks he was tired, but otherwise healthy. Unsuccessful appendicectomy was performed eleven years ago and cholecystectomy two years ago. Abdominal examination revealed only some epigastric tenderness.

CASE V.—A female, aged fifty, a thin, nervous spinster, had a gastro-enterostomy operation fifteen years ago without any benefit. She had nausea and often vomited large volumes of bile-stained fluid, alkaline in reaction, after which she felt quite well, with good appetite. There was some flatulence, but no pain. Nothing of significance was found on abdominal examination.

The results of the X ray and fractional test meal examinations are given in the accompanying table.

Several things typical of colonic spasm are noted as common to all or most of these patients, namely, the neurotic or worried condition, the nausea, flatulence, and distension; and the history of an unsuccessful appendicectomy, cholecystectomy, or gastro-enterostomy (only too common in patients with spastic colons). In addition we find a low or absent gastric acidity and a rather quickened emptying time by the fractional test meal method, with only a small volume of fasting contents, and finally a spastic colon in three cases and radiographic signs of colonic adhesions in the remaining two.

A large volume of fluid appearing above the barium meal in the stomach might conceivably be due to one of the following causes:

1. Gastric retention with fluid remaining from a previous meal. In this case the fasting contents, as determined by the Rehfuss tube, would exceed the normal 30 to 60 cubic centimetres. The test meal and X ray examinations, however, rule out this possibility.

2. A rapid precipitation of the barium from its suspension, as has been suggested by Gefen.[1] The facts, however, that the suspension used was the same as that in routine use by the radiologists concerned, and that precipitation does not occur in other stomachs, are against this hypothesis. Further, the five cases recorded have clinically so much in common that the coincidence of a barium precipitation seems too highly improbable.

3. Increased secretion of gastric juice. The latter seems the only explanation. It is curious, however, that, as the test meal examinations show, the concentration of hydrochloric acid in the gastric secretion was very low or absent, and further, that the secretion did not persist to any noticeable degree after food had disappeared from the stomach.

### The Significance of Hypersecretion.

Most writers state that hypersecretion, when accompanied by subjective symptoms, especially pain, indicates usually an organic lesion, such as duodenal ulcer, appendicitis and renal calculus, the hypersecretion being a reflex phenomenon. The fact that three of my five patients had, in addition to hypersecretion, a spastic colon, and that the

TABLE I.

| Case Number, Sex, Age. | Volume of Fasting Contents in cubic centimetres. | Emptying Time in hours. | Free Hydrochloric Acid in Test Meal at Hours. | | | | | | | | Bile in Meal Samples. | X Ray Report. | Emptying Time by X Rays in hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ½ | ¾ | ¾ | 1 | 1½ | 1¾ | 1¾ | 2 | | | |
| 1 Female 35 years | Nil | 1¾ | 0 | 0 | 0 | 5 | 7 | 0 | 7 | 17 | Nil | Orthotonic, ptosed stomach, "hypersecretion": spastic transverse and descending colon. | 5 – |
| 2 Female 24 years | ? | 1¾ | 0 | 0 | 8 | 9 | 9 | 19 | 19 | — | Nil | Hypotonic, ptosed stomach, "hypersecretion," pyloro-spasm, ? pelvic adhesions to colon. | 6 – |
| 3 Female 57 years | 20 | 1¾ | 3 | 11 | 17 | 24 | 27 | 23 | — | — | Nil | Hypotonic, large stomach, "hypersecretion," spastic descending colon. | 5 – |
| 4 Male 48 years | 55 | 1¾ | 0 | 0 | 0 | 0 | 0 | 0 | — | — | + | Hypertonic, hyperperistaltic, head at splenic flexure at three hours: spastic descending colon. | 3 – |
| 5 Female 50 years | Nil | ¾ | 0 | 0 | — | — | — | — | — | — | ? | Hypotonic ptosed stomach, "hypersecretion," barium rapidly passed through gastro-enterostomy: transverse colon fixed near caecum, with marked stasis. | ¾ |

NOTES.

1. In the fractional test meal emptying time was determined by the disappearance of the starch-iodine reaction.
2. The minus sign in the last column indicates that the emptying time was less than the number of hours stated.
3. Patient 2 had a small breakfast only four hours before the test; 110 cubic centimetres with bile were removed before the test was carried out.
4. In patient 5 the stomach emptied so rapidly that no test meal samples could be obtained. As, however, she vomited alkaline fluid on several occasions, it is assumed that there was no free hydrochloric acid.

evidence in the remaining two cases pointed to colonic adhesions, seems to show that colon conditions must also be considered.

To continue to regard hypersecretion as usually a reflex from some organic lesion will surely lead to still further useless operations when the cause of abdominal pain is colonic spasm. The evidence above would seem to show that hypersecretion can be brought about either reflexly from colonic dysfunction or as part of the neurosis which has caused the colonic spasm.

### Reference.

(1) J. Gefen: *"Zur Frage der Hypersekretion in Röntgenbilde," Deutsche Medizinische Wochenschrift*, 1927, Volume LIII, page 143.

## A SIMPLE TREATMENT FOR RECTAL PROLAPSE.

By DOUGLAS GALBRAITH, M.D. (Glasgow),
*Honorary Physician to Out-Patients, the Children's Hospital, Melbourne.*

PROLAPSE of the rectum is, fortunately, much less frequently met with in Australian children than it is amongst children in the industrial towns in Europe. Still, a number of cases do occur here in Melbourne, and the treatment may offer a difficult problem. Such a child may be leading a miserable existence, the bowel coming down several times a day and having to be replaced by some kindly adult. The child is frightened to be far away from such assistance or to indulge in strenuous games. Frequently chronic diarrhœa accompanies the complaint, a diarrhœa which is refractive to the usual methods of treatment, because it is largely due to the bowel irritation caused by the prolapse. The same sort of spurious diarrhœa and tenesmus is often associated with hæmorrhoids. In the milder cases medical treatment is sometimes effective, but seldom in the long standing cases. One such prolapse I have known to persist right into adult life.

What, then, are the surgical methods at our disposal? Referring to a recently published text book on the surgical diseases of childhood, one finds the following operations advised for this condition: linear cauterization, linear excision of rectal mucosa, stitching the posterior wall of the rectum to the sacrum, suture of the anus. And generally, with such a list facing him, the surgeon returns the patient with a note, "operation not advised meantime."

A very simple method of treatment is available. It is devoid of risk, success can be guaranteed, and the child is able to run about as usual within a few hours of operation. The treatment consists in the injection of alcohol into the perirectal tissue. Dr. Leonard Findlay demonstrated this method in Glasgow some years ago, having seen it used in Vienna, and, at his instruction, I carried out the method in a series of twenty-four cases. In Melbourne I have used it on several occasions and cure has resulted in all cases in both series. One child had a rectal polypus and this had to be removed before cure was effected.

The injected alcohol probably acts in two ways, first by causing a perirectal fibrosis, and secondly by temporarily paralysing the sphincter and thus giving it a chance to recuperate and to regain its effectiveness. Within two or three days of the operation the anus will be found to have lost its patulous appearance and to have regained quite a lot of muscle tonus.

### Technique of Injection.

For a day or two before the operation the child is kept on a semi-fluid diet or one which will leave as little residue in the bowel as possible. Twenty-four hours before operation a moderate dose of laxative is given and twelve hours later an enema of about a litre of warm saline lotion is used. After the child has been anæsthetized, he is placed in the lithotomy position. The skin around the anus having been painted with a weak antiseptic lotion, the gloved, lubricated forefinger of the left hand is passed into the rectum. A fairly long needle of moderate calibre is now inserted one-quarter of an inch lateral to the muco-cutaneous junction (at the "three o'clock" position) and passed for a distance of about 5·6 centimetres (two and a quarter inches) into the perirectal tissue. The finger in the rectum acts as a guide and the needle follows the line of the finger, the object being to keep the point of the needle as near the finger as possible without actually perforating the bowel. A "Record" syringe containing three cubic centimetres of 95% alcohol is now attached to the needle and one and a half cubic centimetres of the alcohol are injected, the needle being then withdrawn and the puncture sealed with collodion. With another needle the same procedure is carried out on the other side of the anus (at the "nine o'clock" position). Finally, a pad of cotton wool is placed between the buttocks, which are then fixed together with adhesive strapping.

### After-Treatment.

For the first week the buttocks must be kept firmly strapped, the strapping being changed every day (petrol should be used to soften the adhesive on each occasion). The child may be allowed up and about whenever the results of the anæsthetic have passed.

From the time of the operation, for a period of about six weeks, the child evacuates the bowel whilst lying on his side on a mackintosh sheet or old newspapers, the strapping being kept in position meantime. A small daily dose of liquid paraffin is of value in keeping the motions soft.

The results of this simple method of treatment are uniformly good and only very occasionally is a second injection required. I have never observed any sloughing nor any other ill-effects from the alcohol, and, curiously enough, it does not appear to cause any pain.

# Reports of Cases.

## THE ACTION OF THE HERPES ZOSTER VIRUS IN ITS MORE UNUSUAL MANIFESTATIONS.

By FRANCIS E. BROWNE, M.B., B.S. (Melbourne),
*Swan Hill, Victoria.*

THE following small series of cases of *herpes zoster* syndrome are of interest in that they clearly demonstrate the diversity of manifestations of the action of the zoster virus and establish what may be called a zoster syndrome involving motor nerves. The four patients whose history is to be reported, were seen by me in April, came from widely different parts of a large country shire, and had not come into contact with one another. The enumeration of the principal clinical features of each case will demonstrate the points of interest.

CASE I: F.G., an elderly man, orchardist, became ill about March 5, 1931. His illness was preceded by a slight naso-pharyngitis for several days. He complained of severe bilateral pains of a neuralgic and burning character involving the thorax from the third to the tenth segments, lasting for about ten days and then subsiding to recur at irregular intervals for some weeks. A typical *herpes zoster* rash appeared on the fourth day; it was scattered over the greater part of the thorax. There was definitely diminished sensation to pinprick extending from segments three to ten, and from the sternum as far lateral as the mid-axillary lines. Other sensory phenomena included a variable degree of pain in both feet accompanied by a feeling of numbness and also a burning pain in the left upper eyelid and a definite anæsthesia to touch over the skin of that eyelid. The knee and ankle jerks were normal and the plantar response was flexor.

The interesting feature in this case is that on the twelfth day there began the gradual development of a partial left oculomotor paralysis, as evidenced by a partial ptosis with a dilated pupil and an absence of the pupil reflex to light and to convergence. The movements of the eye were not impaired and vision was normal. This condition had cleared up by the twentieth day. The oculomotor paralysis was partial only and affected ciliary muscles, the *sphincter pupillæ*, and to some extent the muscle of the upper lid. This case demonstrates therefore a typical intercostal *herpes zoster*, but with two other interesting features, namely, a sensory manifestation involving the upper eyelid, and an involvement of the oculomotor nerve causing a partial paresis.

CASE II: W.W. was an orchardist of middle age. He became ill about April 1, 1931; his illness was preceded by a naso-pharyngitis. For the first three days the only symptom was pain of a neuralgic nature in the left temporal region and face, and to a less extent in the thoracic region. On the third day there began to develop a left-sided facial paralysis becoming complete in ten days and apparently of lower motor neurone type. Accompanying the paralysis was a decided loss of sensation to taste involving the dorsum and edge of the anterior two-thirds of the tongue. This latter information was volunteered by the patient and was undoubtedly a fact. The paralysis and impairment of taste lasted several months, finally clearing up. At no time was there any herpetic rash.

The outstanding feature of this case is the involvement of the *chorda tympani* and geniculate ganglion as well as the facial nerve.

CASE III: J.T., a tailor, aged thirty-five, became ill on April 1, 1931; his illness was preceded by a slight cold. The first definite symptom was a weakness of the right side of the face, which by the fourth day had become a complete right facial paralysis. Also on the fourth day there appeared a typical *herpes zoster* rash on the right cheek over a small area. This cleared up in three days. At no stage was there any pain and no thoracic involvement. The facial paralysis had cleared up by the seventeenth day. There was no demonstrable alteration of taste sensation or of hearing.

Here again we have a case of involvement of a motor nerve and a rash involving a cerebral nerve distribution.

CASE IV: H., a man of seventy-two years of age, an orchardist, became ill on April 1, 1931; his illness was preceded by a naso-pharyngitis. He had severe thoracic girdle pains involving the left side only and corresponding segments five and six, and extending from the sternum to the spine. A rash appeared over segments five and six. By the tenth day he was almost well. There were no other sensory phenomena and no involvement of motor nerves.

Here is a case in which the action of the zoster virus is confined to the thoracic ganglia.

### Comment.

A survey of these four cases with their onset at about the same time is instructive in demonstrating a variance of features which would lead one to believe that the virus of *herpes zoster* is able to attack not only the sensory ganglia, but also to some extent the motor system.

Case I exemplifies a typical *herpes zoster* with extra-thoracic sensory manifestations and with what at first appears to be an oculomotor paralysis. This will be discussed more fully later.

Case II shows but slight thoracic manifestation, but there is a decided involvement of the left facial nerve and of the *chorda tympani* and geniculate ganglion. One is here dealing with what has been described as the zoster syndrome of the geniculate ganglion. The question arises as to the manner in which the facial nerve is implicated. One can conceive of a ganglionitis with swelling and pressure on the adjacent facial nerve fibres and producing an impairment of function of those fibres. Thus the facial manifestations might be purely the consequence of the close anatomical relationship of the motor fibres of the facial nerve and the geniculate ganglion. The ganglion is certainly confined in a small bony space. This explanation could certainly hold in Case II in which are clinically demonstrated a lesion in the tract carrying taste fibres, and also at the same time a facial nerve lesion. The lesion can reasonably be located at the geniculate ganglion.

Case IV exhibits a facial paralysis without any involvement of taste sensation or, as one should say, without any demonstrable impairment of taste sensation. The final distribution of taste fibres by way of the *chorda tympani* and lingual nerves to the anterior two-thirds of the tongue is probably a variable factor and, of course, bilateral. A unilateral lesion might be clinically demonstrable in one case, but not necessarily in another, if the lesion were only partial. Should Case III be not due to a geniculate ganglionitis, the facial paralysis could be accounted for only by assuming some direct action of the zoster virus on the motor nuclei or fibres.

The consideration of Case I shows that there are various possibilities. The clinical facts are as follows: (i) The pupil was enlarged and fixed. (There was no reaction to light or convergence, but a paralysis of the ciliary muscles and of the *sphincter pupillæ* was present.) (ii) There was a ptosis of the upper lid; the ptosis was not complete, for there was some feeble power of raising the lid. (iii) There was no demonstrable involvement of any of the other muscles innervated by the oculomotor nerve.

A consideration of the anatomy and physiology of the ciliary ganglion is instructive. There are situated the cells of the autonomic system giving rise to the fibres which supply the ciliary muscles and the *sphincter pupillæ* muscle. Should these cells be pathologically affected, it would be possible to account for a paralysis of the ciliary and *sphincter pupillæ* muscles with a fixed, dilated pupil. The sympathetic supply to the *dilator pupillæ*, which passes through the ciliary ganglion but is not relayed there, was unharmed. The explanation of the partial ptosis is more difficult. According to Wright there are smooth muscle fibres in the upper lid innervated by the sympathetic fibres which pass on their way through the ciliary ganglion, entering from the naso-ciliary nerve or by a separate root and leaving by the short ciliary nerves. It would be quite logical to assume that these fibres could be involved in a pathological lesion of the ciliary ganglion just in the same way as it has been suggested that the facial nerve is involved in a geniculate ganglion lesion. If so, then there could follow a paralysis of the retractor smooth muscle in the upper lid and a drooping

of the lid, but no interference of the power of raising the lid by means of the *levator palpebræ* muscle innervated by the oculomotor nerve. A ciliary ganglionitis would thus offer an explanation of the phenomena observed in Case I, such a lesion being produced by the zoster virus.

Case IV is the ordinary case of *herpes zoster* in which the lesion is confined to the ganglia of the posterior nerve roots in the thoracic region only.

This series of cases exemplifies the diversity of manifestations that may result from the action of the zoster virus, and especially demonstrates the implication of the cerebral motor nerves. An explanation is offered as to the manner in which the motor nerves are involved, reference being made particularly to the geniculate and ciliary ganglia.

# Reviews.

## ENGLAND AND HER PROBLEMS.

IN view of the world-wide financial depression and of the recent developments in Great Britain, special interest is attached to Professor André Siegfried's book "England's Crisis."[1] Professor Siegfried, well known as the author of "America Comes of Age," is a professor at the École Libre des Sciences Politiques. This book, which was first published in France, has been translated into English by H. H. Hemming and Doris Hemming. Certain chapters have appeared in *The Times*, London.

The first impression gained from reading the book is that the author has studied his problem and that he knows what he is writing about. The importance of this book from an economic, nay, from a national, point of view is great, and in the ordinary course of events the book would merit a lengthy review in which most of the author's arguments were set out and which contained certain important extracts. This journal is, of course, primarily devoted to consideration of the medical sciences, and in these circumstances we must be content to draw the attention of readers to this book, to indicate briefly the lines on which it has been planned, and to urge all who are interested in the future of the British Empire and in the cause of Britain's present plight, to read it.

In his introduction the author points out that during the last hundred years Britain has relied on conditions which were believed to be permanent, but which are proving transitory. "As long as England's mines enjoyed a quasi-monopoly and coal was the only fuel used in industry, so long her manufactures were practically unrivalled." Then he discusses the first signs of decline. In the Britain of the twentieth century there has been a reliance on the spirit and methods of the nineteenth century. Such reforms as have been attempted are insignificant and, at any rate up to the war, no serious efforts were made to transform coal mining, the metal industry or textiles—the three bases on which exports and prosperity were founded. "England is like a venerable mansion which, though well and solidly built, has for years lacked repairs both inside and out."

The book proper is divided into two parts: Part I, "The Post-War Crisis," and Part II, "The Remedies." In Part I the author dissects the causes of the crisis and endeavours to gauge its extent. He discusses unemployment, the curse of the dole, the employers' attitude. He goes into the question of high industrial costs in relation to these factors. The discussion on population is illuminating; the author shows how the industrial centre of gravity has shifted. England is changing. She is inclined to place her hopes in her rôle of world broker, in the management of her great interests abroad or in the creation and protection of a home market, the value of which she is beginning to appreciate. The impression gathered from this part of the book is that the crisis is most serious, that it is the result of inherent national qualities and outlook, but that the state of affairs is not irremediable.

In the second part, that dealing with remedies, the Englishman's attitude is described; the picture is well painted. England is "desperately handicapped in her efforts to reform, for, even in the present unprecedented crisis, no one dares come out boldly and tell the people electorally at any rate, what they must do to break the deadlock: lower the standard of living and work harder." The author discusses rationalization, inflation and protection. He discusses imperial preference, what Britain can expect from the Dominions, what Britain cannot expect from the Dominions, and to what extent Britain can use the Dominions. He deals with the question of an international basis and refers to England's "splendid isolation." Then he refers to the possibility of an alliance with America on the one hand—"a greater Anglo-Saxon *ensemble*"—or with Europe on the other. It is all very interesting and gives scope for endless argument. The author thinks that England will not choose at all, but that, faithful to her tradition and her genius, she will hover between the two groups without giving herself completely to either.

From this short description may be gathered what manner of book this is. Experts in economics and financial matters may find debatable statements within its covers. Hidebound Britishers may detect the note of the foreigner in the writing; we doubt whether they could rightly regard any part of it as prejudiced. Whether readers agree with the conclusions matters not a jot. It will make them think, and this is what matters. The pity is that this book had to be written by a Frenchman. We wonder whether its publication in Europe had anything to do with precipitating the inevitable financial crisis in Britain by shaking the confidence of leaders of finance on the Continent.

[1] "England's Crisis," by A. Siegfried, translated by H. H. and D. Hemming; 1931. London: Jonathan Cape; Sydney: Moore's Book Shop. Demy 8vo., pp. 256. Price: 17s. 6d. net.

## ALCOHOLISM.

"THE ALCOHOL HABIT AND ITS TREATMENT," by Walter E. Masters, is a brochure containing much useful knowledge on this subject.[1]

Dr. Masters champions the cause of the voluntary home type of treatment, and suggests that greater legal powers should be given such institutions to enable them to have more control of patients. The "voluntary home" of Dr. Masters practically does not exist in Australia. The majority of severe alcoholic patients are treated either in the mental wards of the public hospitals, in ordinary private hospitals or in their own homes.

The author deals very fully with the physiological aspects of alcoholism, and reference is made to the recent researches of Mellanby, Southgate and others dealing with the absorption and excretion of alcohol.

When the alcohol in the blood reaches 0·6% there is danger of death from acute alcoholic poisoning. With 0·15% of alcohol in the blood a definite degree of intoxication exists. Within two hours after taking a quantity of alcohol there is a certain proportion circulating in the blood and secreted in the urine. Examination of these fluids will thus give an indicaton as to the degree of alcoholic poisoning. The causes of the alcohol habit are fully considered, as well as the precautions and prophylaxis against the disease. The author's classification of the types of alcoholism is interesting, and he deals fully with the signs, symptoms and treatment of each type.

His treatment is sensible and does not cause undue discomfort to the patient or subject him to unnecessary danger. He strongly advises against the sudden withdrawal of all alcohol in treatment. He advises the use of hypodermic injections of apomorphine in certain cases; this must be given with the greatest care and the dosage must be kept low when any signs of myocardial degeneration are present. The author rightly insists that after the patient leaves the institution, absolute abstention from all forms of alcohol is necessary.

To quote from the able introduction by Sir William Willcox: "It is only by education of the will power, character and self-control of the patient in his after-care, that a complete and lasting cure can be obtained."

[1] "The Alcohol Habit and its Treatment," by W. E. Masters, M.D., M.R.C.S., D.P.H.; 1931. London: H. K. Lewis. Crown 8vo., pp. 207. Price: 6s. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 14, 1931.

*All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.*

*References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.*

*Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.*

## CANCER AND THE PUBLIC.

THE story of the treatment of cancer is punctuated with reference to the need for "educating the public" to seek treatment at an early stage. Health administrators have dwelt on the theme, lecturers and members of various organizations have had much to say about it, leaders of movements and of appeals, and writers in the public Press have done what they could. One memorable committee with ungrammatical fervour went so far as to declare on note paper, poster and adhesive stamp that "one in ten die of cancer." This propaganda has been all to the good. Unfortunately, human beings are peculiarly constituted. Many of them refuse to face facts, and others, while they realize the dangers of certain diseases, prefer to believe that their own persons are immune. The ostrich is not the only animal that buries its head in the sand. It has been shown in a recent study by S. P. Reimann and F. H. Safford that, in 1927, in America at any rate, patients with cancer applied for treatment very little, if any, earlier than they did in 1900. The investigation of Reimann and Safford covered 3,780 cases of carcinoma and was carried out at the Lankenau Hospital Research Institute, Philadelphia. And in America health propaganda is not lacking. In spite of the apparent failure of much of the educational effort, he is a bold man who would argue that good has not been done, and none but the foolish would agree with the suggestion that further preaching of the gospel of early recognition of cancer is useless.

Anyone who sets out to teach, must inspire confidence in his pupil. In order to do this he must know his subject. When medical practitioners set out to teach the general public about cancer, they know full well that there are many gaps in their knowledge. The question as to how far the public should be made aware of the limitations of knowledge in regard to cancer has been debated. It has been suggested that confession of ignorance will give rise to lack of confidence. Everyone, however, knows that the cause of cancer has not been discovered. It would therefore appear to be wise to let people know something of what has been accomplished. The public has in many places, of course, subscribed huge sums of money for cancer research; the subscribers have a right to know what their money has brought forth. If people know what has been done in the field of experimental investigation, if they are taught that cancer assumes different forms, that some of these manifestations respond readily to certain forms of treatment, that diagnosis is sometimes quite simple, that without the active cooperation of the patient diagnosis is often impossible, and that diagnosis may be most difficult, whether the patient makes early application or not, they will understand why they are invited to seek advice when the slightest abnormality presents itself. The more intelligent members of the community know that medicine is not and can never be an exact science, and they realize to quite a large extent how far science may guide those who practise medicine. There can be no doubt, therefore, that cooperation is more likely to result if the medical profession, as far as possible, takes the public into its confidence and if it refrains from using peremptory slogans and catch phrases and from adopting a general attitude of omniscience.

And what of those who are to teach? The public is not blind, it is not composed of fools. Very few will be deceived by the "soap box" type of orator, who mounts his pulpit on every possible occasion with the clear object of attracting attention to his

own person rather than to his doctrine. For the few who are deceived, there are many more who discount the doctrine as they disrate the speaker. Place-seekers of this description do much more harm than good to the cause of preventive medicine. Unless those who teach are sincere and disinterested, they had better desist. For such we would paraphrase an old saying: "Seek ye first the goal of preventive medicine, and all such things as ye deserve will be added unto you."

The discussion of ways and means of teaching the public without creating a cancer phobia must be reserved for another occasion. The second Cancer Conference, held at Canberra last March, suggested that the possibility of undertaking a general educational campaign throughout the Commonwealth should be considered. The Cancer Research Department of the University of Sydney has started an educational campaign in New South Wales, but this is not sufficient. The machinery for a coordinated Commonwealth campaign could be created without much difficulty. In the forefront of such an effort must be kept soundness of doctrine and sincerity of purpose.

## Current Comment.

### MARRIED LIFE.

IF Mr. Punch's advice to young people contemplating marriage were heeded, many people would be happy. Mr. Punch might with advantage have offered some advice to young couples or he might have laid down some conditions on fulfilment of which he would have given his consent. But when a man and a maid are minded to marry, they pay no heed to advice, and the only condition they wish to see fulfilled is that of union, firm and lasting. One might as well try to stop the onrush of a river in flood with a paling from a garden fence as try to prevent the marriage of two determined young people; in fact, to oppose them is to add velocity to the spate of their actions. The words of that delightful old cynic, Mr. Punch, may thus be left, as he no doubt knew they would be, in epigrammatic ineffect. Most people start married life with high hopes and with a feeling that they will make a success of it, though others come to disaster. Very few people sit down beforehand to count the cost and to find out whether their reserves are sufficient to meet it. Marriage is always more or less of a lottery.

Medical practitioners are often faced with problems in their patients' homes, problems which are the result of misunderstanding or maladjustment. More often than not their advice is required in regard to the sexual relations between man and wife. It is important, therefore, that they should study the subject. Unfortunately, too much emphasis is laid on the physical side of marriage and married life. This is partly due to the stream of books on sex, marriage, love, technique in sexual relationships and other aspects that have flooded the market during recent years. It is not to be supposed that each and every one of these books should be regarded as anathema. Some of them have received favourable reviews in this journal, and these, when used in suitable circumstances, cannot fail to be helpful. Others do not bear the stamp of sincerity and may be passed over. The overemphasis of the physical side of married life is seen in a recent medical analysis of one thousand marriages made by R. L. Dickinson.[1]

In his investigation Dickinson tried to obtain details of success or failure in sex adjustment in order that he might make schedules for sex education, for premarital medical instruction and for texts on conjugal hygiene. The woman observed by him is described as of the American "cultural type . . . urban, of good family background and education, a home-maker with a child or two, married to a professional man of moderate income." "The social and economic milieu represented averages well above the middle line of humanity in large cities." It seems rather absurd to limit an inquiry of this sort unless sex education, premarital instruction and conjugal hygiene are intended only for the type described. The details of Dickinson's results (percentages and so forth) need not be considered in the present discussion. Women married to professional men of moderate means are not typical of all women in the community, and it matters little whether 4% or 40% of Dickinson's women "came to the point of divorce or separation" or whether one-sixth or one-sixtieth of the number "had persistent distress in intercourse." To take one factor in married life as reflected in the lives of one thousand women of a small section of the community, to inquire into their sexual lives and to draw general conclusions from the result is absurd.

Dickinson's conclusions are all concerned with sexual desire, the sexual act and sexual relations generally. Two of them must be called in question. In the first place he states that the sole method of planning intelligent prevention and treatment of maladjustment in marriage is systematic study of full case histories of success and failure. If by this he means the study of the persons in all their relationships, intellectual and social as well as sexual, we may agree with him. If, however, as seems more likely from the whole tenor of his article, he is referring only to case histories of success or failure in sex relationships, he must be told to enlarge the scope of his inquiries. This leads to another of his conclusions: "Even when

[1] *The Journal of the American Medical Association*, August 22, 1931.

there are no children, complete unity in marriage stands on a basis of sexual unity." This is the iniquitous sort of teaching which is gaining ground at the present time—passion passes for love, the sensual is set up in place of the spiritual. The only solid foundation of a happy married life is intellectual understanding and social companionship, in other words, a true friendship. Sex should be grafted on to this. If sex is the binding force, what is to happen to husband and wife when age draws on, if indeed they have managed to live together up to that point? Long before old age arrives they would be strangers to one another. The sexual act in married life ought to be the spontaneous expression of love; it must not be allowed to develop into a "dull routine." Nothing could be more horrible than unfailing regularity of the kind described by Laurence Sterne, when he combines for one of his characters the weekly winding of the clock with "some other little family concernments." There is nothing degrading or horrible about sex when it stands in proper relationship to the whole of life. It is high time that somebody wrote for the general public a book in which the proper place is given to sex, in which love is extolled instead of passion, in which the body is depicted as subservient to what, for want of a better term, we may call the spirit.

## "SANOCRYSIN."

"SANOCRYSIN" is a double thiosulphate of gold and sodium. It was introduced in 1924 by Moellgaard, of Copenhagen, in the treatment of pulmonary tuberculosis. It was found to retard the growth of tubercle bacilli in glycerinated bouillon in strengths of one in a million. In 1925 the Medical Research Council issued a preliminary report on the use of "Sanocrysin" in pulmonary tuberculosis. In this report it was stated that the drug appears clinically to have a specific action on tissues infected with the tubercle bacillus; the severity of the constitutional reactions appeared to be directly related to the intensity of the tuberculous infection. The general conclusion was that the results were sufficiently encouraging to demand further clinical study. As time went on, the drug was not without its critics. Several workers drew attention to the risk associated with its use. Bang carried out certain investigations and published results which tended to show that the salt has no bactericidal action *in vitro* and that it is of no value in experimental tuberculosis in rabbits. The consensus of opinion was that the specific action on tuberculous tissue must be accepted. Since its introduction in 1924 "Sanocrysin" has been used by some clinicians and divergent results have been reported. It is therefore of interest to record some experimental work by E. E. Atkin.[1]

Atkin inoculated rabbits with a dose of killed tubercle bacilli capable of producing lesions attended by allergy of such intensity that the animals succumbed to an intravenous injection of old tuberculin. The power of "Sanocrysin" to influence this sequence of events was tested. The details of the experiments need not be described. In one set of experiments five out of seven rabbits were protected by "Sanocrysin" from the lethal effect of a tuberculin injection, but only one out of eight of the untreated controls survived the test. Atkin describes the *post mortem* lesions in the animals. The extent of the lesions corresponded with the result of the tuberculin injection. When the lesions were extensive, it was practically always found that the rabbit was killed by the tuberculin injection. When the animal survived, the lesions were much less extensive, sometimes being restricted to a minimum amount of tuberculous infiltration around some of the vessels. In a second series of experiments six rabbits were treated with the drug; all survived the tuberculin injection and had comparatively small histological lesions in the liver. Four of the five controls which did not receive the drug, died within twenty-four hours, and had relatively large areas of tuberculous infiltration in the liver.

Atkin concludes that "Sanocrysin" "tends in some way to prevent the formation of tubercle." He claims that a very definite inhibitory effect has been demonstrated on both the development of allergy and the growth of tuberculous lesions, and these two are intimately related, if indeed there is not a direct causal connexion between them. That the protection is only partial under the conditions if the experiment is in his opinion shown by other experiments of a similar kind in which the tuberculin injection was delayed; in these as many "Sanocrysin"-treated rabbits as controls died after it and the lesions on histological examination were found to have advanced to the same stage in both. Atkin goes on to state that an inhibitory action of "Sanocrysin" has been shown to exist which is distinct from any possible lethal effect it may have on the tubercle bacillus. This is, however, not to say that it does not act on the bacillus or its toxic substances. The explanation of the result obtained appears to Atkin to be either a destructive action on the irritative bodies provided by the bacillus or some obscure interaction with the tissues resisting the formation of tuberculous lesions.

Atkin's conclusion that "Sanocrysin" exerts an inhibitory effect on tuberculous lesions, apart from any bactericidal action it may have on the living tubercle bacillus, is important. Of course, the conditions obtaining in his experiments are not identical with those operating in human pulmonary tuberculosis. The toxic symptoms manifested after administration of "Sanocrysin" have been attributed to the bactericidal action of the drug and the liberation of endotoxin. If this view and Atkin's conclusions be accepted, it will be necessary in the clinical use of the drug to remember the double-barrelled action; and this double-barrelled action may explain the varying clinical results reported.

[1] *The British Journal of Experimental Pathology*, August, 1931.

# Abstracts from Current Medical Literature.

## OPHTHALMOLOGY.

### Cyclodamia.

DORLAND SMITH (*American Journal of Ophthalmology*, June, 1931) claims that in cyclodamia there is a method of estimating the total refractive error without the necessity of using a cycloplegic. In the examinations of recruits during the war, it was observed that a person with myopia of 1·5 diopter usually had vision of about $^6/_{60}$. It was discovered that when cycloplegia was not used, a more dependable estimate of the total refractive error could often be made by skiascopy checked by blurred vision than by sharp vision alone. This was the germ of cyclodamia. Sharp vision actually stimulates accommodation, but it was found that so long as the vision of both eyes was kept blurred to about $^6/_{60}$, if the astigmatism was previously corrected, the spherical error revealed by such relaxation could be quite accurately measured by deducting 1·5 diopter from such over-correction as blurred the vision to $^6/_{60}$. This was found to be a reliable approximation to the total error whenever relaxation was good. To induce maximum accommodative relaxation the eyes should be tested together, under over-correcting spheres at all times; if one eye has to be excluded for a moment, it should be excluded by the addition of a still stronger sphere instead of by a cover or screen. The blurring most favourable to maximum relaxation is $^6/_{60}$, but sometimes it may be maintained to the $^6/_{12}$ level. It is advisable to estimate the astigmatism by the keratometer or by skiascopy (not by subjective tests) and to put the correction in the trial frame before determining the total spherical error. The spherical lens in the trial frame, which has just reversed the shadow, will in many cases permit the patient to see $^6/_{60}$. If not, it should be increased or decreased as necessary for each eye, 1·5 diopter subtracted and the amount recorded as the $^6/_{60}$ measurement. A similar test is made at the $^6/_{12}$ level, when only 0·5 diopter is subtracted. If these do not agree, relaxation has not been equal.

### Vertigo Persisting After Radical Mastoid Operation.

W. M. MOLLISON (*The Journal of Laryngology and Otology*, March, 1931) records the histories of two patients with persistent vertigo after the radical mastoid operation who were cured by injection of absolute alcohol into the opened external semicircular canal.

### Niemann-Pick's Disease with Cherry-Red Spots in the Macula.

I. GOLDSTEIN AND D. WEXLER report a case of Niemann-Pick's disease in a Jewish girl of ten months (*Archives of Ophthalmology*, May, 1931). She was admitted to hospital with a history of retarded development. There was brownish pigmentation of the skin with gross enlargement of liver and spleen. A diagnosis of lipoid hepato-splenomegaly of the Niemann-Pick type was made on the discovery of numerous vacuolated lymphocytes in the blood smear and from splenic puncture. There was a cherry-red spot at each macula surrounded by a grey ring. Dr. I. Strauss considered that the child did not present the clinical symptoms usually seen in amaurotic family idiocy. The child died five months later. Besides the enlargement of liver and spleen, the autopsy revealed many changes. The lymph glands were enlarged, yellow and flabby. There were a large number of pale vacuolated cells in the liver and spleen. The cortex cells of the suprarenals were filled with lipoid. The lymph glands consisted mainly of foam cells. The brain showed widespread degeneration of parenchymatous cells. The macula showed marked swelling of the tissues about the fovea, owing to œdema of the internuclear layers. The honeycombed appearance in this case, not observed in Tay-Sach's disease, may be taken as an indication of the more serious disturbance in lipoid metabolism in Niemann-Pick's disease. Typical amaurotic idiots do not have an enlarged liver and spleen, nor so great disturbance in lipoid metabolism. Also in many cases of Niemann-Pick's disease cherry-red spots in the fundi are lacking.

### Electrocoagulation of Pterygia.

M. F. C. ZUBACK (*Archives of Ophthalmology*, May, 1931) has removed seven pterygia by surgical diathermy, and considers it a more rapid and economical method than the usual surgical practice. With the patient under "Butyn" anæsthesia, the pterygium is grasped at its broadest part with fixation forceps and raised from the globe. An ordinary sewing needle bent at right angles, with shut arm two millimetres long, is hooked into the neck of the pterygium, half way between the forceps and the limbus. The switch is turned on for a fraction of a second and the amount of coagulation checked. Then the needle is inserted just sufficiently to coagulate the inferior margin, then the superior margin, and, lastly, the mid-portion are similarly coagulated. The neck and head of the growth now turn a distinct white. At the second visit, a week later, the head and neck, as well as part of the body of the growth, will have sloughed off. The remainder is now coagulated with a little more daring, being distant from the cornea. The author admits he began with considerable trepidation.

### Retinal Detachment.

E. C. ELLETT (*Archives of Ophthalmology*, May, 1931) reviews the literature on the more recent operative treatment of retinal detachment. Sourdille adopts the following methods: (i) Four or five punctures are made with a Graefe knife over the site of the detachment, the blade entering at least one centimetre. No notice is taken of the presence or location of retinal holes. (ii) In small, flat detachments a fine galvanocautery (not a thermocautery, as Gonin uses) is introduced into the eye through the scleral punctures, or they may be made with the cautery. In more extensive detachments the scleral punctures are made with the knife and followed by a subconjunctival injection of from one to two cubic centimetres of a one in 1,000 solution of mercuric cyanide. (iii) The patient is "immobilized in bed," on the back for superior detachments, on the side for lateral, and a half-way position for inferior detachments. Finlay evacuates the fluid by a scleral puncture under a conjunctival flap and then superficially cauterizes the sclera near the incision, being careful not to cauterize the incision, hoping to excite an adhesive inflammation which will seal the retina back in position. He first locates the hole. He reports seven cases, with three failures, one success and three improvements. Badeaux prefers a small galvanocautery at white heat to the larger thermocautery of Gonin, or the galvanocautery at *rouge sombre* of Sourdille. "If the case is recent, if I see the tear, I make an incision at the site of the tear, or as near as I can,—and for that I do a Gonin operation, which gives good results in two-thirds of the cases. But I do the operation with a galvanocautery so as not to produce too large a scotoma. If the case is old or if the tear is invisible, I do a Sourdille operation."

### Shortening of a Rectus Muscle.

W. B. LANCASTER (*American Journal of Ophthalmology*, June, 1931) describes an operation for shortening a rectus muscle, in which he uses buried sutures of white silk. The muscle is exposed by a longitudinal incision from limbus to canthus. The conjunctiva is dissected from the muscle above and below, the capsule is incised, and the strabismus hook passed underneath. The muscle is isolated as far back as necessary with two strabismus hooks. Prince's forceps are applied in such a position as to mark the amount of shortening intended. The forceps are clamped to the muscle just in front of the point which the surgeon wishes to attach to the original insertion. The tendon is cut off, a stump of one or two millimetres length being left. A double armed white silk suture is introduced through the stump of the tendon close to the sclera from behind forwards and is brought out in front of the actual insertion. The two needles are introduced in the same way, one near the edge and one near the centre of the tendon; this makes the first stage of a mattress suture. A second double armed suture is placed similarly in the other half of the stump. The two

mattress sutures are now completed by passing the needles from the scleral side through the muscle just behind the Prince's forceps. The conjunctiva is not included. Each mattress suture includes about one-third of the width of the muscle. They are slightly farther apart in the stump than in the muscle. The eyeball is rotated towards the muscle to be shortened, and the muscle is gently pulled forwards over the stump. The sutures are then tied, Prince's forceps are removed. Several other methods are described, and that for a reefing, if so desired.

## OTO-RHINO-LARYNGOLOGY.

### Frontal Sinusitis.

WALTER HOWARTH (*The Journal of Laryngology and Otology*, June, 1931) gives a brief outline of the pathogenesis of frontal sinusitis and states that infections due to the influenza bacillus more frequently lead to chronic sinusitis than infections due to other organisms. He believes that the frontal sinus and the anterior ethmoidal cells are nearly always simultaneously involved, consequently any operation that is considered, must be one which will drain both adequately. A detailed description of the intranasal method of treatment is given and the external operation, as done by the author, is also described. The whole floor of the sinus is removed, including any orbital galleries and extensions. The *os planum* of the ethmoid and the ethmoidal cells are removed right up to the base of the skull. The extent of this depends on how far back it may be necessary to go in the ethmoid labyrinth to get beyond the diseased area. The drainage into the nose is arranged for by removal of a portion of the ascending process of the superior maxilla and of the nasal process of the frontal bone. The maintenance of the patency of the fronto-nasal duct is the chief concern. In the majority of cases no difficulty arises, and the retention of the rubber drainage tube for ten days and subsequent use of bougies, with perhaps occasional touching of granulations with silver nitrate, is all that is necessary.

J. S. FRASER AND J. P. STEWART (*The Journal of Laryngology and Otology*, June, 1931) give an account of all their patients who suffered from frontal sinus infection. They include those treated by means of conservative methods and by intranasal operation in the Ear and Throat Department of the Royal Infirmary, Edinburgh, during the years 1921 to 1930 inclusive, all patients seen in private practice from 1906 to 1930 inclusive, and all patients operated upon by one of the authors by the external route at the Royal Infirmary and in private practice from 1907 to 1930. No attempt has been made to distinguish between catarrhal and suppurative affections of the frontal sinus. All infections of over six months' duration have been regarded as chronic. They deal with 241 acute cases and 97 chronic cases. A detailed description is given of symptoms, examination, treatment and results in each group of cases. Complications are explained and there is added a list of case histories of the more interesting patients. The authors are of the opinion that the cause of the periodicity of pain in frontal sinusitis is the assumption of the erect posture. Frontal headache was present in at least 95% of the acute cases and in only 66% of the chronic cases. Periodicity of pain was noted in 76% of the acute and in only 23% of the chronic, while tenderness on pressure was found in 52% of the acute and in only 37% of the chronic cases. Coincident affection of the other sinuses was more frequent in the chronic (70%) than in the acute cases (60%). Nearly fifty of these patients were referred to the Ear and Throat Department from the Ophthalmological Department, to which the patients had first of all been sent by their own doctors. It is evident that many general practitioners are as yet ignorant of the symptoms and signs of frontal sinusitis. They appear to think that supraorbital headache, with pain and tenderness over the eyebrow region, is due to some visual disturbance. Neither transillumination nor radiography is absolutely to be relied on in the diagnosis of frontal sinusitis. In acute middle ear suppuration it is very common to have an acute maxillary sinusitis on the same side, but rare to have the frontal sinus also affected. The authors admit that in many of their radical frontal sinus operations there is considerable disfigurement. Many of these patients were operated upon after it had been found that Killian's operation was unsatisfactory and even dangerous, but before the publication of Howarth's paper. In future they intend to make more frequent use of Howarth's procedure, especially in acute cases. They believe that incision in the (unshaven) eyebrow line leaves a less noticeable scar than when the incision is made beneath the eyebrow. It is noteworthy that tear sac troubles very seldom follow external operation on the frontal sinus and ethmoid. In their series there was only one patient who suffered from epiphora following operation.

DOUGLAS HARMER AND BEDFORD RUSSELL (*The Journal of Laryngology and Otology*, June, 1931) describe their experiences during the last ten years in the treatment by intubation of sixty-three patients suffering from frontal sinusitis. The operation has proved simple and free from danger. The aim of the operation is twofold: first, to provide free drainage and ventilation, both externally and internally, secondly, to dilate the bony fronto-nasal canal without damaging its lining membrane. Intubation with an elastic tube fulfills both these requirements, and if the tube is slowly enlarged, it does not cause any irritation or inflammation. Under general anæsthesia an incision, 18 millimetres (three-quarters of an inch) long, is made immediately below the inner end of the eyebrow, the supraorbital nerve not being divided or exposed. With a chisel and mallet an opening is made into the sinus above the supraorbital ridge, large enough to admit the tip of the little finger. The centre of the opening should be nine millimetres (three-eighths of an inch) from the middle line, a point usually directly above the infundibulum. A thin silver probe, bent in a circular form, is passed through the infundibulum into the nose, its lower end being seized and dragged outside the anterior naris. A long piece of stout linen thread is tied to its lower end and the probe is withdrawn so that the thread is pulled through the infundibulum and out of the wound above the eye. A soft rubber catheter is attached to the lower end of the thread and pulled through into the wound. The external wound is not closed by sutures (except in vacuum cases without discharge), as it is better to have free drainage above and below in the early stages of the treatment. As a rule it is necessary to begin with about a number 3 catheter, and in a chronic case to enlarge the opening gradually up to a number 7 or 10; when this is done, the duct should be permanently dilated and the tube can be removed. The authors give their results of this treatment in acute and chronic frontal sinusitis and for mucocele and vacuum sinusitis. This method has proved so satisfactory that it has become the routine treatment at Saint Bartholomew's Hospital for all forms of frontal sinusitis that cannot be cured by intranasal treatment.

### The Ear in Congenital Syphilis.

N. ASHERSON (*The Journal of Laryngology and Otology*, May, 1931) gives the clinical observations of fifty patients, suffering from congenital syphilis, investigated chiefly with the view of eliciting the presence and frequency of compression nystagmus in the disease. The patients ranged from infants to children at puberty, and all had been subjected to anti-syphilitic treatment. The compression nystagmus sign is described. This sign was found in 20% of these patients. In twelve out of the fifty patients a characteristic appearance in the form of a lead blue coloration of the tympanic membrane was detected. The infrequency of chronic otorrhœa in patients suffering from congenital syphilis is commented upon. In this series deafness occurred in only four of the patients; this shows that treatment will not prevent the onset of deafness which may affect both ears simultaneously or one ear at a time; that remissions in intensity of the deafness occur, but that the latter never clears up completely.

# Special Articles on Aids to Diagnosis.

*(Contributed by Request.)*

## VII.

## THE CUTANEOUS TUBERCULIN TESTS OF PIRQUET AND MANTOUX.

THE difficulty of making an early diagnosis of tuberculosis remains an outstanding fact in clinical medicine. To its aid there have been brought many laboratory tests, of which few have stood the test of time. Since Koch presented to the medical world in 1889 tuberculin, once believed to be the endotoxin produced by the tubercle bacilli, but now recognized to be a very complex and still imperfectly analysed substance, there have been many tests devised for its use as a diagnostic agent in tuberculosis. Concerning the value of these tests controversy has been and still is rife. Two of the tests at least still retain the confidence of most authorities as aids to diagnosis in tuberculosis, and they alone will be discussed.

The cutaneous test of the late Clemens Pirquet is the best known of the many tests devised for ascertaining the sensitivity of a patient to tuberculin. Once also the most widely used, it is now tending to be superseded by the intracutaneous test associated with the name of Mantoux. It is proposed to describe the technique of carrying out both these tests and to give reasons why that of Mantoux is to be preferred. The significance of the cutaneous tuberculin reaction will then be discussed as an aid to the diagnosis of tuberculosis.

### The Pirquet Test.

It is convenient to employ the package prepared by the Commonwealth Serum Laboratories, which contains one or more tubes of undiluted tuberculin, each sufficient for one test, with a corresponding number of tubes of glycerine bouillon as controls. Though tuberculin obtained from both human and bovine strains is available, the distinction is not of practical importance. A patient, the subject of tuberculous infection, is allergic to all tuberculins, and an equal reaction will be given to all. In making over two hundred Pirquet tests at the Pulmonary Clinic of the Royal North Shore Hospital to test this point, no patient was found who reacted selectively to only one of the tuberculins; either no reaction was obtained or an equal positive reaction to both.

The skin of the flexor surface of the forearm is cleaned with ether or alcohol and two drops of tuberculin are placed thereon. About ten centimetres distally, two drops of the control solution are placed. With a sterilized surgical needle the skin midway between the drops is scarified with three or four cross hatched scratches which should be sufficiently deep to draw serum, but not blood. In the same way scarify through the control drop, and lastly through the tuberculin. Care must be taken to follow this order and to see that the tuberculin is proximal, lest lymph drainage may result in a tuberculin reaction in the control areas. The scratched areas should all be approximately the same size. When they are dry, in about ten minutes cover with a strip of gauze strapped to the skin at both ends, but open laterally; a bandage must not be applied.

A positive reaction shows itself as a red papule about one centimetre in diameter, often with a surrounding erythematous blush. This reaches its maximum in forty-eight hours, the optimum time for recording the result. The traumatic reaction of the central area should have quite subsided by this time. The bouillon control reaction should be less marked than the tuberculin reaction. If it is not, the patient is allergic to glycerine bouillon and the test is vitiated. This rarely happens in practice.

### The Mantoux Test.

The Mantoux test is made by injecting tuberculin directly into the skin, with the formation of an "orange-skin" bleb. Different dilutions of Koch's old tuberculin are employed, but a safe standard to use is a strength of one in 1,000. This should be freshly prepared, as it loses potency in four or five days. One-tenth of a cubic centimetre is injected with a hypodermic syringe into the skin of the flexor surface of the forearm. The site of the injection is then covered as previously described.

Like that of Pirquet, this is a forty-eight hour test, though a reaction may be seen in twenty-four hours. Both tests may be read as "+," "++" or "+++," according to the severity of the reaction. Thus a "+++" reading would show an urticarial wheal of one centimetre in diameter, with a surrounding erythematous areola of some three centimetres across. A "+" reaction would have a wheal of perhaps 0·25 centimetre with an areola very small or even absent. Intermediate reactions would be read as "++." With no reaction or a "+" reaction, if the diagnosis is still in doubt, the test should be repeated. That of Mantoux can be made in increased strength, 0·1 cubic centimetre of a one in one hundred dilution being injected.

The Mantoux is a more sensitive test than that of Pirquet, and it gives a higher percentage of positive reactions. It also has the advantage that a measured dose of tuberculin is given, and results with it are strictly comparable, whereas with the Pirquet an uncertain amount of tuberculin is given, and oftentimes probably a minute fraction is absorbed into the skin. Finally, compared with the Pirquet method, the technique of the Mantoux test is simpler and the test is more quickly performed. For a single patient in private practice, however, it is probably more convenient and, provided it is carefully done, very nearly as satisfactory to use the Pirquet test.

### Significance of the Tests.

The cutaneous tuberculin tests tell us whether infection with the tubercle bacillus has occurred and not whether the patient is suffering from tuberculosis. The appreciation of this fact is fundamental, and failure to recognize this has been responsible for much uncertainty and error in diagnosis. The positive result is an allergic response, dependent on the patient's having been at some time sensitized to the specific bacterial products of the tubercle bacillus. It indicates, therefore, a focus of infection somewhere in the body, but this focus may be active, it may be latent or it may be healed.

What, then, is the value of the test? Its uses may be enumerated thus:

1. A failure to react at any age is of great significance. If tuberculosis is suspected, particularly in an ailing child, a failure of reaction to the Mantoux test puts this diagnosis out of court. There are exceptions to this, allergy being often lost in the final stages of a generalized tuberculous infection and immediately after measles, influenza, whooping cough, and occasionally after other infective fevers. In the last mentioned condition the test should be repeated after an interval of three months.

2. In infants under two years of age a positive reaction can be taken as an indication of active disease, because at that age infection is very likely to be followed by disease; the two are here nearly synonymous terms.

3. In an adult a positive reaction is of very little value, practically all city dwellers giving a positive result. However, in Australia the percentage of positives is not so high as in most other countries, and the cutaneous test is worth using in doubtful cases, a failure to react being, of course, alone of value.

4. In children up to the age of twelve approximately one in every four in Australia gives a positive reaction to the skin test. It is in these reactors that the greatest difficulties occur, and there is room for the greatest differences of opinion. It is unwise to be dogmatic here, and studied moderation is advisable. Let us then admit no more than that a child who has symptoms of toxæmia not accounted for by other evident source of infection and who gives a positive Mantoux or Pirquet reaction, may be suffering from tuberculosis. Physical signs should be discounted very greatly, at least in suspected intrathoracic disease. It is a safe rule, in young children, that the more physical signs there are present in the chest, the less likely is the disease to be tuberculosis. But the opinion of an experienced radiologist on a properly taken skiagram, if positive in the hypothetical case mentioned, would

warrant a diagnosis of active tuberculous disease. A diagnosis of tuberculosis, based on a positive result to a skin test and the presence of physical signs in the chest, is, however, unwarranted unless all other intrathoracic disease has been excluded.

COTTER HARVEY,
M.B., Ch.M. (Sydney), T.D.D. (Wales),
*Honorary Physician, Clinic for Pulmonary Diseases, Royal North Shore Hospital; Honorary Assistant Physician, Royal Prince Alfred Hospital.*

# British Medical Association News.

## SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Sydney Hospital on July 9, 1931. The meeting took the form of a series of demonstrations by members of the honorary staff. The first part of the report of this meeting was published in the issue of October 24, 1931.

### Paralysis of Cranial Nerve and Tabes Dorsalis.

DR. E. H. STOKES showed a man, forty-seven years of age, who was suffering from paralysis of the third cranial nerve and from *tabes dorsalis*. The patient was referred from the eye department, where he reported on account of drooping of the lid and squint in the left eye of one week's duration. He also complained of giddiness on walking of one week's duration, and weakness in the legs for eight months. He had a chancre in 1907 and was treated for three years with medicine only.

On examination paralysis of the third nerve was present. The pupil was fixed, it reacted to accommodation only; the fundus was normal. The knee jerks were absent. Rombergism was present. No signs of aortic disease were found. At the time of the meeting the result of the Wassermann test was not available.

Dr. Stokes showed a photograph of the patient's condition before treatment. The patient had had four injections of "Novarsenobillon" and the ptosis had disappeared.

Dr. Stokes's second patient suffered from paralysis of the left sixth nerve and *tabes dorsalis*. He was a gardener, aged forty-nine years. He was first seen on May 18, 1931, complaining of double vision for three weeks and giddiness while walking. The Wassermann test, performed at another hospital a week before, gave a positive reaction. He suffered from syphilis eleven years ago and was treated at Saint Vincent's Hospital and privately. He had six intravenous injections (probably "Salvarsan") and sixteen intramuscular injections (probably mercury).

On examination the left pupil was larger than the right; both pupils reacted to light. Paralysis of the left external rectus muscle was present. The arteries were thickened and tortuous. The systolic blood pressure was 215 and the diastolic pressure 135 millimetres of mercury. The urine contained no albumin. The patient was treated for some weeks with a mixture containing mercury and biniodide of potash. The renal tests were then performed and gave the following results, which were considered satisfactory enough to warrant the injection of arsenical compound: Blood urea nitrogen, 23 milligrammes per hundred cubic centimetres; blood creatinin, 1·5 milligrammes per hundred cubic centimetres; urea concentration test: before urea was given, 1·67; one hour after urea was given, 1·67; two hours after urea was given, 2·97; three hours after urea was given, 2·97.

Dr. Stokes said that the patient had received two injections of 0·3 gramme of "Novarsenobillon." There was a moderate reaction after the first injection, but the patient was not upset after the second. His eye condition had shown very little improvement.

### Pulmonary Tuberculosis.

Dr. Stokes also showed two patients suffering from pulmonary tuberculosis who had been treated by artificial pneumothorax. The first patient, a man, was first seen in October, 1930, when he complained of a cough with sputum, loss of weight and night sweats. There was no hæmoptosis. On examination, dulness with prolonged expiration was found at the apex of the left lung. X ray examination of the left lung revealed fibrosis and cavitation of the upper left lobe. The sputum contained tubercle bacilli. Dr. Stokes pointed out that since collapse of the left lung had been brought about by the induction of artificial pneumothorax, the patient had shown considerable improvement. There was no sputum and the signs of toxæmia had disappeared.

The second patient was a woman, aged twenty-three years, who had been under treatment since October, 1929, for tuberculosis of the right pulmonary apex, by means of artificial pneumothorax. Before treatment was commenced the patient was suffering from extreme toxæmia and was losing weight rapidly. There was evident dulness at the lower part of the right upper lobe, and tubular breathing with crepitations was present. Dr. Stokes pointed out that in the latest skiagrams the apex was well collapsed and there was practically no sign of the original condition.

### Pernicious Anæmia.

Dr. Stokes also showed a man suffering from pernicious anæmia, who was being treated by "Ventriculin." The patient was first seen in the out-patient department in April, 1931; when diagnosis was difficult owing to the colour of the skin. Three possibilities suggested themselves, namely, hæmochromatosis, Addison's disease and Addison's anæmia. The urine contained no sugar. The systolic blood pressure was 140 and the diastolic pressure 90 millimetres of mercury. The blood picture was typical of pernicious anæmia, and the erythrocytes numbered 1,300,000 per cubic millimetre. A test meal revealed total achlorhydria. Dr. Stokes pointed out that the patient had made great progress and appeared to be normal; he felt practically well.

### Urological Exhibits.

DR. REGINALD BRIDGE showed a number of urological specimens. These included hypernephroma and papillary carcinoma of the renal pelvis. There were a number of specimens illustrating the destructive effect of calculus in its various phases. There were specimens of renal tuberculosis, from the earliest invasion of a few pyramids to complete destruction in the ulcero-cavernous form. Dr. Bridge showed in association with each specimen the pyelograms used in the preoperative diagnosis. He also showed a patient in whom the ureters had been transplanted into the rectum for intractable interstitial cystitis.

### Encephalography.

DR. L. BUCHANAN showed a series of encephalograms. The first was from a man who four years ago suffered from sudden coma for one week. His speech was unintelligible for three months, and his memory, even of his wife, was absent for nine months. In this instance an encephalogram revealed two cerebral emboli.

The second encephalogram was from a patient who suffered from a fracture of the right parietal bone six years ago. This was followed by severe headache, which was present every day. An encephalogram revealed multiple cysts along the course of the middle meningeal artery and its branches. Craniotomy was performed, and portion of the *dura mater*, with adhesive pachymeningitis, was removed. Bosses of bone on the dural surface of an old fracture were drilled away. After four months the patient was seeking work.

The third encephalogram was from a man, aged fifty-four years, who gave a vague history of fracture of the skull thirty years ago with a blow on the top of the head from a bottle. He suffered from mild progressive dementia. The family history was good. He demanded a "trepan" for ten years. He was totally deaf, and his blood did not react to the Wassermann test. An encephalogram revealed general absorption of brain substance. The intracranial pressure was 100 millimetres of water. Dye tests were

not carried out on account of the failure of the patient to cooperate. Deficient absorption by the sagittal sinus was suggested as a cause. No improvement occurred after the encephalogram was made. At operation no pachymeningitis was found. Four weeks after the operation the patient was "morosely subnormal"; he was now "jocosely subnormal."

The next encephalogram was from a man, forty-three years of age, who had been treated for five weeks early in 1929 in a country hospital for what was regarded as concussion. X ray examination revealed no pathological lesion. The patient suffered from typical Jacksonian epilepsy. The patient could not lie on his left side on account of headache. The encephalogram revealed obliteration of the sulci of the right fronto-parietal region. Craniotomy was performed and dense fibrous pachymeningitis with a cyst 2·5 centimetres in diameter was removed. Dr. Buchanan pointed out that the patient had been cured for two years and that he had worked for one month as a ship's fireman.

The next encephalogram was from a man, fifty-three years of age, who suffered in 1929 from a linear fracture of the base of the skull and of the left parietal and temporal bones. He could not lie on the left side on account of headache. The headache was constant. The blood did not react to the Wassermann test. The encephalogram revealed multiple cysts in an area of pachymeningitis along branches of the middle meningeal artery. The intracranial pressure was low. The result of the encephalogram was complete relief from headaches. The patient was still dizzy on stooping, and unfit for work. Operation had been deferred. Dr. Buchanan pointed out that the patient's memory was bad, that his interests were childish, that he was very comfortable, and that he was receiving compensation.

### Endothermy.

Dr. Buchanan showed a number of patients who had been subjected to various operations by endothermy. He pointed out that with endothermy no ligatures of any kind were used, except for an operation of appendicectomy. He said that absence of any sense of resistance necessitated greater care and a more accurate appreciation of anatomical relations. With increasing experience wound healing had improved, but had not in any instance been equal to the perfect result obtained by the ordinary steel knife and ligature. Hæmostasis was amazingly complete and easy to obtain. It could be effected in situations in which ordinary surgical methods were not suitable—a meningeal artery hidden under a bone flap or in brain substance of a person suffering from hæmophilia.

### Deformities of the Spine and Hips.

DR. C. NIGEL SMITH and DR. JOHN HOETS showed a youth, aged eighteen years. The patient was born in Scotland and lived there until he was nine years old. He seemed well until the age of three, whn he was knocked on the left thigh with a football. He cried with pain and was in bed for a week. He made a good recovery and seemed well until three years ago, when he was again knocked with a football, this time on the right thigh. His back was first noticed not to be straight nine years ago. He complained of pain in the right shoulder and hip. On examination there was pronounced dorso-lumbar curvature of the spine, well compensated so that there was practically no pelvic tilting. There was very slight shortening of the right lower limb as compared to the left. Movement at the right hip was limited to a few degrees of flexion; slight abduction was present, but no rotation was possible. X ray examination showed the whole spine to be involved in an S-shaped curve. Slight wedging was present at the apices of the curves, but no gross lesion of the vertebræ was seen. The left hip presented a picture typical of old quiescent Perthes's disease with short femoral neck and broad, flat head. The condition of the right hip was unusual; the femoral head had completely disappeared, the neck ending at the line of the epiphysis, practically straight across. It was thought probable that a separation of the whole epiphysis occurred at an earlier age. There was a faint shadow in the skiagram which might be the remains of the head lying behind the neck. The gross S-shaped spinal curvature was probably the result of early tilt of the pelvis and collapse owing to defective muscular tone. Poliomyelitis could not be definitely excluded as a condition superimposed on the Perthes's disease.

### Injury to the Brachial Plexus.

Dr. Smith and Dr. Hoets also showed two patients who had sustained an injury to the brachial plexus. The first was a man, aged forty-six years, who was knocked down by a motor car in August, 1925. His left clavicle was fractured and his arm paralysed. In September, 1925, the reaction of degeneration was present in all the arm muscles, in the deltoid and in the pectorals. In the following April some return of power was noticed in the deltoid and pectoral muscles. In August, 1926, the triceps showed some return of power. In January, 1927, the biceps was contracting voluntarily. In May, 1927, there was a response in the *flexor carpi radialis* and *supinator longus* muscles. In March, 1928, the flexors of the wrist were acting satisfactorily and those of the fingers were active. In October, 1929, the patient could pronate and supinate the forearm. In March, 1930, the extensors of the wrist showed some return of power. In February, 1931, the patient was still improving and the forearm was filling out. It was pointed out that so far there was no return of power in extension of the fingers and that the intrinsic muscles of the hand were still useless.

Dr. Smith and Dr. Hoets also showed a girl, aged seventeen years, who suffered from complete avulsion of the brachial plexus. Six years ago the patient was leading a horse when the animal suddenly drew back and threw up its head. There was immediate loss of power and sensation in the whole of the patient's upper limb. The nerve routes were explored at another hospital and found to be ruptured at their exit from the bony foramina so that repair was impossible. The first sign of recovery was noticed three years after the injury. The power of voluntary movement followed the return of sensation from the shoulder region down to the hand. At the time of the meeting there was appreciation of heat and cold and of touch over the whole limb, including the fingers. Movements at the shoulder and elbow were satisfactory. There was some flexion at the wrist and the slightest power of flexion of the fourth finger. The condition was still improving.

### Tic Douloureux.

Dr. Smith and Dr. Hoets showed a man, aged forty-one years, who had been subjected to cervical sympathetic trunk section for *tic douloureux*. The trouble began five years ago. The patient was under medical treatment for three months. Pain gradually disappeared, except for slight recurrences, which gradually became worse until Christmas, 1930. At this time the attacks were very severe and frequent. The patient's rest was disturbed and the pain interfered with his eating. He lost weight but slightly. Injections of urea and quinine hydrochloride into the soft tissues of the teeth, the "trigger" spot (exit of the infraorbital nerve) were given in the latter part of January, 1931. Temporary relief followed for a few weeks, but then the spasms of pain became worse than ever and almost intolerable. In April, 1931, right cervical trunk section was done. There was immediate and almost complete relief of pain for about a week. Then attacks of pain began again. They were very mild at first, but gradually became worse, though they were still less frequent than before. At the end of May, during one week-end, the spasms of pain were just as severe as ever before, and more frequent. Since then there had been only mild and infrequent attacks. It was pointed out that the patient could sleep undisturbed, could wash, shave, eat *et cetera* with slight twinges only, which were occasionally sharp, but which were not to be compared with the previous attacks.

### Congenital Absence of the Fibula.

Dr. Smith and Dr. Hoets also showed a boy, aged fourteen years, who was suffering from congenital absence

of the fibula. Owing to this condition, the foot became displaced to the other side of the leg, and there was 12·5 centimetres (five inches) of shortening. The foot was amputated and it was pointed out that with the limb made by the Commonwealth Limb Factory the patient was very comfortable and walked with scarcely any noticeable limp. It was thought that with slight adjustment the limb would last for several years.

## NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Palfreyman, Colin Russell, M.B., B.S., 1930 (Univ. Melbourne), Alfred Hospital, Prahran, S.1.

Watson, Gerald Darnton Talbot, M.B., B.S., 1931 (Univ. Melbourne), c.o. F. Bayston, 15, Gardiner Road, Hawthorn, E.2.

James, Ian Clinton, M.B., B.S., 1931 (Univ. Melbourne), Melbourne Hospital, Melbourne, C.1.

# Hospitals.

## THE ROYAL ALEXANDRA HOSPITAL FOR CHILDREN.

### PERTUSSIS.

DR. DONALD VICKERY, who has been in charge of the out-patient clinic for the treatment of pertussis at the Royal Alexandra Hospital for Children, has forwarded a report on the treatment of pertussis in infants. Although the subject may possibly be regarded as elementary, the disease is often fatal to infants. The following report has therefore been made in the hope that it will draw attention to the value of vaccine treatment.

I have been requested by various members of the medical profession to record the treatment of pertussis as carried out during the period July, 1927, to June, 1928, at the out-patients' pertussis clinic of the Royal Alexandra Hospital for children.

Pertussis was in epidemic form during the spring and early summer of this period. There were some eight hundred patients treated at the time, two hundred of whom were under the age of two years. Special statistics were kept of these two hundred cases. I intend to record only the conclusions I have drawn from consideration of the results of their treatment.

First, there are two tables deducted from the New South Wales Statisticians' report. These tables speak for themselves.

TABLE I.

*Showing death rate from pertussis for each of the first five years of life, for all other ages, and total death rates.*

| Year. | Age Period (Years). | | | | | | Total. |
|---|---|---|---|---|---|---|---|
| | One. | 1-2 | 2-3 | 3-4 | 4-5 | Other Ages. | |
| 1927 | 142 | 36 | 12 | 10 | 3 | 8 | 211 |
| 1928 | 63 | 31 | 2 | 2 | 3 | 2 | 103 |
| 1929 | 128 | 52 | 15 | 9 | 2 | 6 | 212 |

These tables show that 86% of the deaths from pertussis in the three years mentioned occurred in children under two years of age.

The conclusions can be tabulated under the four headings: (*a*) Vaccine treatment, (*b*) drug treatment, (*c*) general treatment, (*d*) prophylactic treatment.

### Vaccine Treatment.

Pertussis vaccine was found useful as a curative agent in all stages of the disease. The earlier the vaccine was commenced, the shorter the disease became. Pertussis vaccine should never be withheld from a baby under two years of age, no matter how long the disease has been in progress.

TABLE II.

*Showing number of deaths from pertussis under two years of age compared with total number of deaths from pertussis at all other ages, and percentage under two years.*

| Year. | Number of Deaths under Two Years of Age. | Number of Deaths all Other Ages. | Total Deaths. | Percentage of Deaths under Two Years. |
|---|---|---|---|---|
| 1927 .... | 178 | 33 | 211 | 84 |
| 1928 .... | 94 | 9 | 103 | 91 |
| 1929 .... | 180 | 32 | 212 | 85 |

Vaccine should be continued in doses on alternate days until the child has two or less than two mild spasms during the night. The number of spasms by day is no very definite criterion of the severity of the disease. In active children spasms are generally more frequent, due entirely to their activity, but the number and severity of the spasms during the night is the great test of progress of the disease, and it is a thing that is so vividly impressed on the mother's mind that she can always give correct details about it. Some patients with very severe pertussis may need up to eight injections.

It is remarkable to note the steady decrease in the number and severity of spasms during the night after each successive injection. If this progressive improvement is not seen, one must suspect some complication. On first reporting, the mother may state that the child was having as a rule from six to fifteen spasms per night. After the first injection a few reported some relief. After the second a greater number reported fewer and less severe spasms. After the third a still greater number were improved. After the fourth many children had good nights and two or less than two spasms. If the general condition of the child and chest signs were favourable, vaccine treatment was discontinued at this point, otherwise further injections were given. The average number of injections given to this series under two was five injections.

When relapse occurred, an additional two or three injections of the vaccine almost invariably was effective.

The dosage of vaccine was as follows: (In all cases vaccine prepared by the Commonwealth Serum Laboratories was used and doses were given on alternate days as far as possible.) In babies under twelve pounds in weight, when "D" strength was used, one cubic centimetre of which contains 5,000 millions of the Bordet-Gengou organism, the dosage was: 0·25, 0·5, 0·75 and 1·0 cubic centimetre. Any further dosage was kept at one cubic centimetre. In babies over twelve pounds in weight the dosage was: 0·5, 0·75 and 1·0 cubic centimetre, keeping at one cubic centimetre for future doses (occasionally in the largest children under two years injections up to 1·5 cubic centimetres were used). In no case was there any unfavourable general reaction. Somtimes the mother stated that the child was feverish and restless the night following injection, but such children were generally very much better on the second night after the injection. Evidently a mild general reaction is the ideal to be aimed at. No local reaction ever caused any alarm.

Children whose pertussis was complicated by bronchitis with many chest signs were generally those who had reached the third or fourth week of the disease, or even later and had sought no treatment; in these the normal microbic inhabitants of the naso-pharynx had probably complicated the condition. A mixed pertussis vaccine was used. Mixed pertussis vaccine contains 400 million *Bacilli pertussis*, 50 million *Bacilli influenzæ*, 50 million *pneumococci*, 100 million *Micrococci catarrhalis*. Doses of 0·5, 1·0 and 1·5 cubic centimetres were administered even to the smallest babies. If the spasms showed little sign of becoming less frequent and less severe after the fourth injection, the vaccine was changed to "D" strength, and generally gave good results.

### Drug Treatment.

The mixture used in the great majority of the cases was the *mistura ipecacuanhæ composita* of the "Royal Alexandra Hospital for Children Pharmacopœia."

*Sodii bicarbonatis*, 0·24 gramme (four grains).
*Vini ipecacuanhæ*, 0·3 mil (five minims).
*Tincturæ camphoræ compositæ*, 0·3 mil (five minims).
*Spiritus ætheris nitrosi*, 0·3 mil (five minims).
*Aquam ad* 8·0 mils (two fluid drachms).

Dose: 4·0 mils (one fluid drachm) every four hours.

For the first few months the *mistura propertussis* of the Royal Alexandra Hospital for Children Pharmacopœia was used. This contains the three bromides, belladonna and bicarbonate of soda. This was replaced almost completely for the following reasons: (i) Bromide makes a particularly depressing disease more depressing. Babies with pertussis do not need to be any more depressed than the exhaustion from coughing and the loss of food makes them. (ii) The difficulty for a baby with this disease is not "the falling off to sleep" (most babies with severe pertussis after a coughing spasm will fall off to sleep from sheer exhaustion, even while you are examining them), but "the difficulty of keeping them asleep," and the only drug which will do this is one which will depress the respiratory centre, make it less sensitive to afferent vagal stimuli and thus give the child a chance to sleep, and morphine was found to be the most suitable drug; it is used in the form of small doses of *tinctura camphoræ composita*. It is the extreme sensitiveness of the respiratory reflex in pertussis that wakes the average baby, and by depressing this reflex a great deal can be done to give a child a fair amount of sleep in one of the most prolonged, exhausting, damaging and fatal diseases of infancy. I know that I am attacking an age-old theory in discrediting bromides in the treatment of pertussis. I am convinced that in very nervous and older children bromide has its uses. For in these older children who are not so relatively exhausted by the disease, the fear of a spasm coming on often initiates that spasm, and bromides in such children calms their higher centres and makes the disease for them a little less dreadful, but probably compound tincture of camphor does this as effectively. (iii) Belladonna, too, in my opinion is a drug that has been over-estimated in the treatment of pertussis. Belladonna makes a particularly dry disease more dry. It is an antispasmodic, but needs to be given in heroic doses to overcome the spasm in pertussis, and in spite of babies standing huge doses of it well, these doses are not large enough to control the spasms appreciably. But in the bronchitis cases as mentioned above, for which the mixed vaccine is used, it certainly can be a help when secretion is copious and easily coughed up, but as a rule secretion is scanty and extremely tenacious. If desired, it can be added to the compound tincture of camphor mixture as above. (iv) Sodium bicarbonate, apart from its sedative qualities to digestion and its anti-acid effect in the mild acidosis of the disease, according to its pharmaceutical qualifications makes a tenacious secretion from the lung less tenacious. (v) Ipecacuanha wine has the reputation of being able to "bring up" most things, and anything which aids to remove that tenacious piece of mucus with which the young child has so much difficulty, should recommend itself as a suitable drug. And this brings one to the question of vomiting, which I will include under the next heading.

### General Treatment.

*Vomiting in Pertussis.*—Many babies waste considerably through loss of food in this condition. The treatment found most successful is to give a smaller meal ten to fifteen minutes after the spasm which has initiated the vomiting. This small meal is generally retained.

Diarrhœa, too, has often to be dealt with in pertussis in infancy. If frequent, it must be treated on the usual strict "gastro-enteritic" lines, but if it is mild and occurs only during the severity of the spasm, the drugs compound tincture of camphor and bicarbonate of soda and vaccine treatment as described will soon control it. However, the diet and nutrition should be carefully watched in young children with pertussis. It is advisable to see that the child is getting sufficient sugar to combat any mild acidosis, which readily occurs in these children. Glucose in solution is recommended.

Most pertussis patients do best by treatment out of hospital. In a hospital pertussis ward one child will have a spasm and by some psychic influence the contagion of this spasm spreads in a few seconds like a bush fire through the ward, and five or six or more children will be all having coughing spasms. This means that a child is probably having 20% or 30% more spasms than he would otherwise have if treated alone or with two or three others at home. This control of the number of spasms is often the deciding factor in young babies between a successful and fatal issue. Anything which is conducive to the increase of spasms, such as activity, cold air, fright or the presence of other children with pertussis must be reduced to a minimum if many of these babies are to be saved.

Home treatment is possible only while the mother's "nerve" lasts, for some of these spasms in babies are certainly terrorizing, but if the thing is explained to the average mother and she is instructed how to deal with the spasm, even if the worst happened she will never regret the fact that the child did not go to hospital. It is generally the other way round.

Direct sunlight applied systematically to the skin, especially in the latter part of the disease, is a valuable curative measure. Fresh air and avoidance of sudden drops in temperature are also necessary to successful treatment, and there is no doubt that for the final removal of the cough and return to robust health, change of climate, especially of the drier inland type, with suitable tonic is excellent.

A mustard plaster (one part to nine of water) applied to the chest for half to three-quarters of an hour after application of *linamentum camphoræ* will give many a good night's sleep to the child. Also menthol nasal drops have their uses as a mild antiseptic and anæsthetic, and certainly do good in the condition.

### Prophylactic Treatment.

Pertussis vaccine will prevent the disease in 90% of contacts, provided the injections are made prior to the onset of the first signs of coryza; even then the disease will often be cured without a whoop having developed. In any case, it always cuts short the duration of the disease. Three successive doses of pertussis vaccine, "D" strength, given according to the first three therapeutic doses as above, was the method used. This immunity will last for an indefinite time, probably three to six months, and all young children who are contacts, should have the privilege of it. It is often the child going to school who brings the disease home, and if a diagnosis is made in the early stage, it gives ample time for the younger members of the family to have preventive doses of vaccine.

In the case of children under two, coming from protected country areas to the city for holidays and limited periods, when epidemics are prevalent here, one is justified, owing to the extreme severity of this disease, in suggesting preventive inoculation, even if the inoculation has to be repeated the following year, for after two years of age the child has a greatly improved chance of fighting out the disease.

The amount of chronic ill-health brought about by the unsuccessful treatment of or a prolonged course of pertussis, not to mention the huge death rate in children below two years of age, is seen every day by those dealing with children. This ill-health and lung damage is a field for the direct establishment of chronic bronchitis, fibrosis, bronchiectasis, tuberculosis, both glandular and lung, and for the sensitizing of that reflex which is so often the cause of asthma in children.

### Conclusion.

In conclusion I should like to draw attention to certain grave signs and symptoms which one must particularly note when treating children at an out-patient pertussis clinic, that is, out of hospital. I have already dealt with

the symptoms of vomiting and diarrhœa; these in themselves generally respond to the treatment prescribed, but they may rapidly become very serious and need at all times careful attention.

Wasting which occurs out of all proportion to the vomiting, is a sign which suggests miliary tuberculosis or tuberculous bronchopneumonia.

Excessive drowsiness is always a bad sign and is an indication of either extreme exhaustion or cerebral complications, such as œdema or hæmorrhages.

Convulsions occurring during the treatment of pertussis are of extremely bad prognosis. Asphyxia or cerebral irritation or damage is the main cause.

Suffused cyanotic appearance of the face is a sign of extensive lung complication in the form of bronchopneumonia, large areas of emphysema or especially acute tuberculous bronchopneumonia or miliary tuberculosis. This suffused bluish appearance is generally associated with a very rapid pulse, a sign which also shows extreme exhaustion and cardiac strain. There is generally a combination of two or more of these signs, such as extreme wasting with suffused bluish tinge, and this is almost diagnostic of an acute tuberculous condition of the lungs.

Excessive drowsiness and rapid pulse often go hand in hand and are an indication of the extreme cardiac strain to which the child is being subjected.

Failure to note a progressive diminution both in the number and severity of the spasms at night after each successive injection, especially after the third and subsequent injections, should lead one to make a very careful examination for complications.

It often requires some courage not to admit to hospital a baby when the mother states that: "The spasm is so severe, doctor, he goes black." Provided that in between the spasms the child is comparatively bright and that none of the above-mentioned signs and symptoms are present, my advice is "to continue with the vaccine and keep the child out of hospital." These signs and symptoms are evidence of cardiac, lung or brain damage and the anoxæmia caused by severe spasms is likely to cause one of these systems to fail suddenly, but where these systems are comparatively healthy, as evidenced by the absence of the above-mentioned signs, the very anoxæmia will release the spasm before any of these systems are liable to give out. In no such case treated in this way out of hospital did I ever regret not admitting the child.

# Proceedings of the Australian Medical Boards.

## VICTORIA.

THE undermentioned have been registered under the provisions of the *Medical Act*, 1928, of Victoria, as duly qualified medical practitioners:

Galbraith, Thomas, M.B., 1924 (Univ. Sydney), 1, Severn Street, Moonee Ponds, W.4.

Bennett, Hyam Jacob, M.B., B.S., 1931 (Univ. Melbourne), "Morea," First Avenue, Aspendale.

Bonnin, Josiah Grant, M.B., B.S., 1931 (Univ. Melbourne), Ararat.

Buxton, Thomas Fowell, M.B., B.S., 1931 (Univ. Melbourne), 980, Lygon Street, North Carlton.

Cawthorn, Frank Raymond, M.B., B.S., 1931 (Univ. Melbourne), 1, Raleigh Street, Malvern, S.E.4.

Coto, Ralph Jackson, M.B., B.S., 1931 (Univ. Melbourne), Koroit.

Crouch, Kenneth Stanton, M.B., B.S., 1931 (Univ. Melbourne), 49, Carlisle Street, St. Kilda.

Davies, Eric James, M.B., B.S., 1931 (Univ. Melbourne), 37, Horne Street, Elsternwick.

Greenham, Roy Iverach, M.B., B.S., 1931 (Univ. Melbourne), Spring Bank, Dartmoor.

Harry, Norman Marshall, M.B., B.S., 1931 (Univ. Melbourne), 328, Barker's Road, Hawthorn, E.2.

Hayden, Francis Joseph, M.B., B.S., 1931 (Univ. Melbourne), 26, Sunnyside Avenue, Camberwell, E.6.

Hemsley, Roy, M.B., B.S., (Univ. Melbourne), 22, Ardoch Street, Essendon, W.5.

Hodges, George Chapple, M.B., B.S., 1931 (Univ. Melbourne), 205, Royal Parade, Parkville.

James, Ian Clinton, M.B., B.S., 1931 (Univ. Melbourne), "Arundel," Commercial Road, Melbourne, S.C.3.

Johnson, John Gavin, M.B., B.S., 1931 (Univ. Melbourne), 16, The Ridge, Canterbury, E.7.

Johnstone, James Walter, M.B., B.S., 1931 (Univ. Melbourne), "Fountaindale," Korumburra.

Jones, Lorna Doreen, M.B., B.S., 1931 (Univ. Melbourne), The Manse, Grange Road, Ormond.

Kenny, James William, M.B., B.S., 1931 (Univ. Melbourne), 37, Howe Crescent, South Melbourne.

Kirsner, Lazer, M.B., B.S., 1931 (Univ. Melbourne), Nunn Street, Benalla.

Oliphant, John Alexander, M.B., B.S., 1931 (Univ. Melbourne), 158, Alma Road, East St. Kilda, S.2.

Lawson, Robert Sutherland, M.B., B.S., 1931 (Univ. Melbourne), 336, Barker Street, Castlemaine.

Merritt, Arthur Albert, M.B., B.S., 1931 (Univ. Melbourne), 48, Hamersley Road, Subiaco, Western Australia.

O'Brien, Edward Donough Ernest Eugene, M.B., B.S., 1931 (Univ. Melbourne), 34, Mitford Street, St. Kilda, S.3.

O'Connor, Joseph Lionel, M.B., B.S., 1931 (Univ. Melbourne), 277, Tooronga Road, Glen Iris, S.E.6.

O'Donoghue, John Gregory, M.B., B.S., 1931 (Univ. Melbourne), 350, Danks Street, Middle Park, S.C.6.

Officer, Robert, M.B., B.S., 1931 (Univ. Melbourne), 16, Outram Street, West Perth, Western Australia.

Phillips, Albert Raphael, M.B., B.S., 1931 (Univ. Melbourne), 9, Herbert Street, Flat 4, St. Kilda, S.2.

Reynolds, Marjorie, M.B., B.S., 1931 (Univ. Melbourne), 6, Gascoyne Street, Canterbury, E.7.

Rothstadt, Leon Eric, M.B., B.S., 1931 (Univ. Melbourne), 101, Droop Street, Footscray.

Sewell, Jack Prentice, M.B., B.S., 1931 (Univ. Melbourne), 833, Burwood Road, Upper Hawthorn, E.3.

Somerset, John Bowie, M.B., B.S., 1931 (Univ. Melbourne), 37, St. George's Road, Toorak, S.E.2.

Synan, Dorothy Florence, M.B., B.S., 1931 (Univ. Melbourne), 20, Thomas Street, Kew, E.4.

Walsh, John Lovitt, M.B., B.S., 1931 (Univ. Melbourne), c.o. E. S. and A. Bank, Chapel Street, Windsor.

Warden, Ramsay, M.B., B.S., 1931 (Univ. Melbourne), Melbourne Hospital, C.1.

Watson, Gerald Darnton Talbot, M.B., B.S., 1931 (Univ. Melbourne), c.o. F. Bayston, 15, Gardiner Road, Hawthorn, E.2.

Wedlick, Phyllis Thornton, M.B., B.S., 1931 (Univ. Melbourne), 22, Glen Street, Hawthorn, E.2.

Additional diplomas registered:

Grove, John Lewers, M.D. (Melbourne), 1931.

Mortensen, Henry Newman, F.R.C.S. (Edinburgh), 1930, M.S. (Melbourne), 1931.

Dodd, Norman Laidman, M.D. (Melbourne), 1931.

Bothroyd, John Strahan, M.D. (Melbourne), 1931.

McLean, Ian Gideon, M.D. (Melbourne), 1931.

Brothers, Charles Ronald David, M.D. (Melbourne), 1931.

Turner, Edwin Watchorn, M.D. (Melbourne), 1931.

Howard, Russell Norfolk, M.D. (Melbourne), 1931.

Macknight, Ella Annie Nobel, M.D. (Melbourne), 1931.

Cooper, Robert William, M.D. (Melbourne), 1931.

Scholes, John Lelean, M.D. (Melbourne), 1931.

## Books Received.

A TEXT-BOOK OF GENERAL BACTERIOLOGY, by E. O. Jordan, Ph.D.; Tenth Edition; 1931. Philadelphia: W. B. Saunders; Melbourne and Christchurch: James Little. Royal 8vo., pp. 819, with illustrations. Price: 36s. net.

RECENT ADVANCES IN ALLERGY (ASTHMA, HAY-FEVER, ECZEMA, MIGRAINE, ETC.), by G. W. Bray, M.B., Ch.M., with foreword by A. F. Hurst; 1931. London: J. and A. Churchill. Demy 8vo., pp. 444, with 98 illustrations. Price: 12s. 6d. net.

PRACTICAL PHYSIOLOGICAL CHEMISTRY, A BOOK DESIGNED FOR USE IN COURSES IN PRACTICAL PHYSIOLOGICAL CHEMISTRY IN SCHOOLS OF MEDICINE AND OF SCIENCE, by P. B. Hawk, M.S., Ph.D., and O. Bergeim, M.S., Ph.D.; Tenth Edition; 1931. Philadelphia: P. Blakiston's Son and Company. Royal 8vo., pp. 947, with illustrations, some of which are in colour. Price: $6.50 net.

HYPERTENSION AND NEPHRITIS, by A. M. Fishberg, M.D.; Second Edition; 1931. London: Baillière, Tindall and Cox. Royal 8vo., pp. 620, with illustrations. Price: 30s. net.

A MANUAL OF EMBRYOLOGY, THE DEVELOPMENT OF THE HUMAN BODY, by J. E. Frazer, F.R.C.S.; 1931. London: Baillière, Tindall and Cox. Crown 4to., pp. 494, with illustrations. Price: 30s. net.

BURTON, ARABIAN NIGHTS ADVENTURER, by F. Downey; 1931. Australia: Angus and Robertson. Demy 8vo., pp. 310, with illustrations. Price: 10s. net.

THE FIFTH CONTINENT, by E. O. Hoppé; 1931. London: Simpkin Marshall; Australia: Angus and Robertson. Royal 4to., pp. 192, with photographic plates. Price: 21s. net.

SATURDAY MORNINGS, by Walter Murdoch; 1931. Australia: Angus and Robertson. Crown 8vo., pp. 240. Price: 6s. net.

THE SPIRIT OF RESEARCH, by T. Brailsford Robertson, Ph.D., D.Sc., Edited by J. W. Robertson; 1931. Adelaide: F. W. Preece and Sons; Sydney: Angus and Robertson. Crown 8vo., pp. 221. Price: 8s. 6d. net.

THOSE TEETH OF YOURS: A POPULAR GUIDE TO BETTER TEETH, by J. Menzies Campbell, D.D.S., L.D.S., F.R.S.E.; Second Edition; 1931. London: William Heinemann (Medical Books) Limited. Crown 8vo., pp. 162, with 17 illustrations. Price: 3s. 6d. net.

PRACTICAL MORBID HISTOLOGY: A HANDBOOK FOR THE USE OF STUDENTS AND PRACTITIONERS, by R. Donaldson, M.A., M.D., Ch.B. (Ed.), F.R.C.S.E., D.P.H., with foreword by Sir Humphry Rolleston; Second Edition; 1931. London: William Heinemann (Medical Books) Limited. Crown 4to., pp. 497, with 214 illustrations. Price: 42s. net.

THE NATURE AND TREATMENT OF STAMMERING, by E. J. Boome, M.B., Ch.B., D.P.H., T.D., and M. A. Richardson; 1931. London: Methuen and Company, Limited. Crown 8vo., pp. 143. Price: 3s. 6d. net.

## Diary for the Month.

Nov. 17.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Nov. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Nov. 25.—Victorian Branch, B.M.A.: Council.
Nov. 26.—South Australian Branch, B.M.A.: Branch.
Nov. 26.—New South Wales Branch, B.M.A.: Branch.
Nov. 27.—Queensland Branch, B.M.A.: Council.
Dec. 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.
Dec. 1.—New South Wales Branch, B.M.A.: Ethics Committee.
Dec. 2.—Victorian Branch, B.M.A.: Council.
Dec. 2.—Victorian Branch, B.M.A.: Annual General Meeting.
Dec. 3.—South Australian Branch, B.M.A.: Council.
Dec. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Dec. 10.—New South Wales Branch, B.M.A.: Branch.
Dec. 11.—Queensland Branch, B.M.A.: Branch (Annual).
Dec. 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Dec 18.—Queensland Branch, B.M.A.: Council.

## Medical Appointments Vacant, etc.

**For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xii.**

HOBART PUBLIC HOSPITAL, TASMANIA: Junior Medical Officer.

LAUNCESTON PUBLIC HOSPITAL, TASMANIA: Medical Superintendent.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCH. | APPOINTMENTS. |
|---|---|
| NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney. | Australian Natives' Association.<br>Ashfield and District United Friendly Societies' Dispensary.<br>Balmain United Friendly Societies' Dispensary.<br>Friendly Society Lodges at Casino.<br>Leichhardt and Petersham United Friendly Societies' Dispensary.<br>Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney.<br>North Sydney Friendly Societies' Dispensary Limited.<br>People's Prudential Assurance Company Limited.<br>Phœnix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries.<br>Australian Prudential Association, Proprietary, Limited.<br>Mutual National Provident Club.<br>National Provident Association.<br>Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | Members desiring to accept appointment in ANY COUNTRY HOSPITAL, are advised to submit a copy of their agreement to the Council before signing, in their own interests.<br>Brisbane Associated Friendly Societies' Medical Institute.<br>Mount Isa Mines.<br>Toowoomba Associated Friendly Societies' Medical Institute. |
| SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide. | All Lodge Appointments in South Australia.<br>All Contract Practice Appointments in South Australia. |
| WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.